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Graduate Catalog 1991-1993

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University of New Haven

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GRADUATE SCHOOL CATALOG 1991-93

300 Orange Avenue
West Haven, Conn. 06516
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Graduate Admissions: (203) 932-7133

This catalog supersedes all previous bulletins, catalogs and brochures published by the Graduate School and describes academic programs to be offered beginning in fall 1991. Graduate students admitted to the university for the fall of 1991 and thereafter are bound by the regulations published in this catalog.

The University of New Haven is committed to affirmative action and to a policy which provides for equal opportunity in employment, advancement, admission, educational opportunity and administration of financial aid to all persons on the basis of individual merit. This policy is administered without regard to race, color, national origin, age, sex, religion or disabilities not related to performance. It is the policy of the University of New Haven not to discriminate on the basis of sex in its admission, educational programs, activities or employment policies as required by Title IX of the 1972 Educational Amendments. This school is authorized under federal law to enroll non-immigrant alien students.

Inquiries regarding affirmative action, equal opportunity and Title IX may be directed to the director of equal opportunity.

Every effort has been made to ensure that the information contained in this publication is accurate and current as of the date of publication; however, the university cannot be held responsible for typographical errors or omissions that may have occurred.

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The university reserves the right, at any time, to make whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, policies, regulations and academic programs prior to the start of any class, term, semester, trimester or session. All such changes are effective at such times as the proper authorities determine and may apply not only to prospective students but also to those already enrolled in the university.

ACADEMIC PROGRAMS

Accounting (M.S.)
Business Administration (M.B.A.)
Business Administration/Industrial Engineering (M.B.A./M.S.I.E.)
Business Administration/Public Administration (M.B.A./M.P.A.)
Community Psychology (M.A.)
Computer and Information Science (M.S.)
Criminal Justice (M.S.)
Electrical Engineering (M.S.E.E.)
Environmental Engineering (M.S.)
Environmental Science (M.S.)
Executive M.B.A.
Fire Science (M.S.)
Forensic Science (M.S.)
Hotel and Restaurant Management (M.B.A. concentration)
Industrial Engineering (M.S.I.E.)
Industrial/Organizational Psychology (M.A.)
Industrial Relations (M.S.)
Management Systems (Sc.D.)
Mechanical Engineering (M.S.M.E.)
Occupational Safety and Health Management (M.S.)
Operations Research (M.S.)
Public Administration (M.P.A.)
Taxation (M.S.)
Tourism and Travel Administration (M.B.A. concentration)

Senior Professional Certificates

Accounting (3 options)
Applications of Psychology
Computer and Information Science
Finance
General Management
Health Care Management
Hotel and Restaurant Management
Human Resources Management
International Business
Marketing (2 options)
Occupational Safety and Health Management
Public Management (2 options)
Public Safety Management
Taxation (2 options)
Telecommunication Management

Professional Certificates

Arson Investigation
Civil Engineering Design
Criminal Justice/Security Management
Fire Science/Administration and Technology
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Health Care Management
Human Resources Management
Industrial Hygiene
International Relations
Legal Studies
Logistics
Logistics/Advanced
Long-Term Health Care
Mental Retardation Services
Occupational Safety
Public Administration

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Fall Term 1991	**Monday, Sept. 9 – Saturday, Dec. 14**	
	Last day to petition for January graduation	**Tuesday, Oct. 15**
	Holiday (Thanksgiving), no classes	**Monday, Nov. 25 – Saturday, Nov. 30**
	Commencement	**Saturday, Jan. 18, 1992**
Winter Term 1992	**Thursday, Jan. 2 – Wednesday, April 1**	
	Holiday (M.L. King Day), no classes — a make-up class will be scheduled	**Monday, Jan. 20**
	Last day to petition for June graduation	**Monday, March 2**
	Commencement	**TBA**
Spring Term 1992	**Monday, April 6 – Saturday, July 4**	
	Holiday (Good Friday), no classes — a make-up class will be scheduled	**Friday, April 17**
	Holiday (Memorial Day), no classes — a make-up class will be scheduled	**Monday, May 25**
	Holiday (Independence Day), no classes — a make-up class will be scheduled	**Saturday, July 4**
Summer Term 1992	**Monday, July 13 – Tuesday, Aug. 25**	
Fall Term 1992	**Monday, Sept. 14 – Saturday, Dec. 19**	
	Last day to petition for January graduation	**Thursday, Oct. 15**
	Holiday (Thanksgiving), no classes	**Monday, Nov. 23 - Saturday, Nov. 28**
	Commencement	**Saturday, Jan. 16, 1992**
Winter Term 1993	**Monday, Jan. 4 – Saturday, April 3**	
	Holiday (M.L. King Day), no classes — a make-up class will be scheduled	**Monday, Jan. 18**
	Last day to petition for June graduation	**Monday, March 1**
	Commencement	**TBA**

Spring Term 1993

Monday, April 5 – Saturday, July 3

Holiday (Good Friday), no classes —
a make-up class will be scheduled **Friday, April 9**

Holiday (Memorial Day), no classes —
a make-up class will be scheduled **Monday, May 31**

Summer Term 1993

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THE GRADUATE SCHOOL

The University of New Haven is a private, coeducational university with a contemporary and innovative view of higher education.

The graduate programs at the University of New Haven offer students the opportunity to enhance skills and knowledge for already-chosen careers in highly technical and competitive fields. Other students studying at the graduate level are preparing to enter new careers or are planning to continue their education at the doctoral level. Most graduate programs offer multiple areas of specialization; flexibility in elective choices; opportunities for field work, internships, independent study and research; and the possibility of combining a cooperative education work experience as part of the curriculum.

The university's faculty is outstanding in its combination of highly qualified, full-time academics (88 percent of whom hold doctoral or terminal degrees from a broad spectrum of prestigious institutions) and part-time faculty members employed in area businesses and professions who bring, in addition to academic degrees, practical insight and experience to the classroom.

The Graduate School offers a doctoral degree in management systems and more than 20 master's degree programs. Classes are offered at locations across Connecticut.

The main campus in West Haven offers all academic programs. At off-campus locations in Clinton, Groton-New London, Middletown, Stamford, Trumbull, Wallingford and Waterbury graduate courses are offered in subjects leading to master's degrees in business administration, computer and information science and other programs.

Graduate School courses are offered on a 13-week trimester schedule, beginning in September, January and April. A condensed summer term is also offered. Most graduate courses are scheduled during the early evenings and on Saturdays to meet the needs of part-time, employed students.

Accreditation

The University of New Haven is a coeducational, nonsectarian, independent institution of higher learning, chartered by the General Assembly of the State of Connecticut.

The University of New Haven is accredited by the New England Association of Schools and Colleges, Inc., a nongovernmental, nationally recognized organization whose affiliated institutions include elementary schools through collegiate institutions offering postgraduate instruction.

Accreditation of an institution by the New England Association indicates that it meets or exceeds criteria for the assessment of institutional quality periodically applied through a peer group review process. An accredited school or college is one which has

available the necessary resources to achieve its stated purposes through appropriate educational programs, is substantially doing so, and gives reasonable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the New England Association is not partial but applies to the institution as a whole. As such, it is not a guarantee of the quality of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

The university holds membership in the Council of Graduate Schools, the Northeastern Association of Graduate Schools, the Academy of Criminal Justice Sciences, the Accreditation Board for Engineering and Technology, the American Council on Education, the Association of American Colleges, the National Association of Independent Colleges and Universities, the College Entrance Examination Board and is a member of other regional and national professional organizations.

History

The University of New Haven was founded in 1920 as the New Haven YMCA Junior College, a branch of Northeastern University. The college became New Haven College in 1926 by an act of the Connecticut General Assembly. The college moved to its current location in 1960.

In 1969, New Haven College added the Graduate School to its established baccalaureate programs. Initially offering programs in business administration and industrial engineering, the Graduate School expanded rapidly. Today a doctoral program, more than 20 master's programs and additional courses have pushed graduate enrollment to more than 2,500.

On the fiftieth anniversary of the founding of the college in 1970, New Haven College became the University of New Haven, reflecting the increased scope and the diversity of academic programs offered.

Today, the university offers more than 100 graduate and undergraduate degree programs in six schools: the Graduate School; the School of Arts and Sciences; the School of Business; the School of Engineering; the School of Hotel, Restaurant and Tourism Administration; and the School of Professional Studies and Continuing Education.

New Haven

The University of New Haven is located in south central Connecticut, between New York City and Boston, Massachusetts. Situated on a West Haven hillside overlooking Long Island Sound, the campus is easily accessible by car (from Interstate 95), bus and train service as well as local airports.

New Haven, just ten minutes away from the campus, is a city where arts and cultural activities flourish and coexist with science and business. Settled in 1638 and rich in history and heritage, New Haven is proud of its past, prouder of its present and actively planning for its future. The city is a manufacturing center, a deep-water harbor, a major art center, a college town with seven colleges and universities in the immediate area, and the "Gateway to New England."

New Haven is home to the Shubert, Palace, Long Wharf and Yale Repertory theaters; the New Haven Symphony; and a number of museums including the Peabody Museum of Natural History, the Eli Whitney Museum, the Yale Center for British Art, and the oldest university gallery in the western hemisphere, the Yale Art Gallery.

Campus

The university's 70-acre campus contains 20 buildings that house modern laboratory and library facilities, the latest computer equipment, an athletic complex and residential facilities.

The Main Campus includes administration and classroom facilities in Ellis C. Maxcy Hall (the main administration building), the Graduate School, the Jacob F. Buckman Hall of Engineering and Applied Science, Echlin Hall Computer Center, the

Marvin K. Peterson Library, the Student Center, the Psychology Building, Robert B. Dodds Hall (which houses the School of Business), the Campus Store, residence halls and the Gatehouse, which contains the Office of the Division of Continuing Education.

The South Campus includes Harugari Hall, which houses the School of Hotel, Restaurant and Tourism Administration, and the Student Services Building where students will find the Graduate Records Office, the Registrar's Office, the International Services Office, Financial Aid Office and other departments. The university's athletic fields and gymnasium are located at the North Campus site.

Admission

General Requirements

Admission requirements for the doctoral degree program in management systems are fully described beginning on page 66.

Applicants to the University of New Haven Graduate School are required to have an undergraduate degree from an accredited institution. Certain programs have additional requirements for admission, details of which are included in the program listings in this catalog.

Admission decisions are based primarily on an applicant's undergraduate record. A prospective student who is currently completing undergraduate study should submit an official transcript complete to the date of application. In most cases, an admission decision will be made on the basis of a partial transcript, contingent upon completion of the baccalaureate degree. Registration will not be permitted until a final, official transcript is submitted to the Graduate School Admissions Office.

Students may submit scores from the Graduate Record Examination (GRE), the Graduate Management Admission Test (GMAT) or the Miller Analogies Test in support of their applications. Students applying to certain programs will be required to submit test scores from one of the above examinations. Information regarding specific requirements for submission of test scores is contained in the program descriptions elsewhere in this catalog.

Procedure

An applicant for admission to the Graduate School must submit the formal application form, two letters of recommendation, complete official transcripts of all previous college work, the non-refundable application fee and test scores (if required). Application materials are located in the back of this catalog.

Application to the doctoral program requires special forms which are available from the Graduate School Admissions Office.

In most cases, students may be admitted for any term with the exception of doctoral students who are usually admitted for the fall term only. Should a student be unable to enter the Graduate School during the term for which admission is granted, the acceptance will remain open for one calendar year. After one year, a new application for admission may be required.

Admission Categories

Admitted applicants and students in the Graduate School are assigned to one of four categories: fully accepted, provisionally accepted, special or auditor.

Domestic students who wish to matriculate in a degree program, but who have not completed the application process and/or have not yet received a formal acceptance decision, may register as *in-process* students for one term while completing the application process.

A bachelor's degree is required for admission to all categories listed below.

Fully Accepted

Students accepted without special stipulations for entrance into a regular degree program or certificate study are classified as fully accepted students.

Provisionally Accepted

An applicant whose undergraduate grade point average falls below the standard set for full acceptance, or whose undergraduate background otherwise indicates a need for additional coursework or a short period of academic supervision and review, may be accepted provisionally. Students accepted provisionally should seek advice from the appropriate coordinator or adviser during the provisional period.

Students must complete the requirements stipulated in the provisional acceptance at the beginning of the program of study. Upon completion of the provisional requirements, each student's record will be evaluated for admission as a fully matriculated candidate for the degree.

Special

Special student status is reserved for students who do not wish to matriculate in a degree program or certificate study. Registration in this category is limited to no more than 12 credit hours of graduate work. Students who wish to continue graduate work must be accepted into a specific graduate program. Special students are responsible for meeting prerequisite requirements for the courses they wish to take.

Auditor

An auditor is allowed to attend class and is expected to participate in class discussions and complete the required assignments. An auditor receives no grade or credit toward any degree. While auditor status does not imply admission to any of the graduate degree programs, there is an official registration procedure and a notation of audit placed on the transcript. Both current students and new students are eligible to audit University of New Haven Graduate School courses.

Admission of International Students

University of New Haven graduate programs are open to qualified international students. To qualify for graduate school, a prospective student must have completed sufficient undergraduate preparation in a degree program acceptable to the University of New Haven Graduate School.

Because the review of applications from international students takes considerable time, it is important that international student applications and all supporting materials be received by the Graduate School prior to the deadline dates outlined in the international student information packet.

U.S. Immigration regulations require that a student holding a student visa make satisfactory progress toward a degree. Satisfactory progress requires full-time study, which is generally interpreted to mean completing at least three courses each trimester. Prospective international students should note that not all graduate programs are designed to permit full-time study. A complete listing of such programs is provided on pages 20-21.

To apply for admission to the Graduate School and to be ready to begin study, prospective international students must complete all of the steps outlined in the following section.

International Application Process

All applicants must submit the following application materials:

1. A completed application form and the appropriate application fee.
2. Two letters of recommendation.
3. Official transcripts of all undergraduate work and graduate work completed. Applicants may be asked to provide substantiation of courses taken, grades received, and the academic reputation of the undergraduate school within the educational system of the country in which the school is located. A certified English translation must accompany all non-English transcripts.
4. Proof of English proficiency. This must consist of one of the following:
   a. The Test of English as a Foreign Language (TOEFL) examination with a score of 500 or above. (Certain programs require a higher TOEFL score.)

b. Proof that undergraduate instruction and coursework has been done in English.
c. Completion of the advanced level of intensive English language training in an approved program. Special arrangements may be made through the Graduate Admissions Office for such training at the New Haven Adult Education Center (located one mile from the main campus), at the ELS English Language Center at Albertus Magnus College or at Strong Hill Language Institute, all in New Haven.

Students whose TOEFL scores are less than 550 and/or students who enter the Graduate School following completion of an intensive English language training program are required to take E 600 English Language Workshop in the first term of enrollment at the Graduate School.

5. Financial documentation. International students must provide verification of sufficient funds for study and living expenses at the University of New Haven for 12 months. This verification must be one of the following:
   a. Completed University of New Haven Financial Statement of International Students form and supporting documents.
   b. Current official scholarship letter.

   The University of New Haven does not offer need-based financial assistance to international students.
6. Acceptance fee of $50. This non-refundable fee must be paid before immigration documents (IAP-66 for J-1 students or Form I-20AB for students entering the United States on F-1 visas) will be issued. This fee is not credited toward tuition and is not required for scholarship students.

Appropriate documents (IAP-66 for J-1 students or Form I-20AB for students entering the United States on F-1 visas) will be issued only after a student has submitted all required materials, has been accepted in a program of study, has provided acceptable proof of English proficiency and financial status, and has paid the $50 acceptance fee.

Initial Attendance at the University. All international students accepted into the Graduate School must report to the International Services Office before registering at the Graduate School.

At the time of registration, students will be required to pay a one-time international student fee of $100 (non-refundable) and the tuition and fees for one trimester.

The international student fee is required of all international undergraduate and graduate students at the university. The fee directly and indirectly supports a variety of services and programs for international students including: orientation programs, cross-cultural workshops, local community activities, international alumni programs, subscriptions to international newspapers and magazines for the campus library, and operation of the International Services Office.

All full-time students must subscribe to the university health insurance program. This coverage supplements the services provided by the campus Health Services Center. Part of the premium (approximately $50 per year) for the health insurance will be charged to all full-time students.

Registration

Registration deadlines are listed in the course schedules published for each term. Returning students and new students who have been admitted to programs will receive registration materials and can register by mail.

Domestic students who have not completed the application process and/or have not yet received a formal acceptance decision may register as *in-process* students. International students may not register as *in-process* students. In-process students will not receive registration materials in the mail but may register in person at the main campus or at an off-campus center. Proof that the in-process student has an undergraduate degree will be required at the time of registration, and, whenever possible, unofficial transcripts of previous coursework should be provided to facilitate advisement. In-pro-

cess status remains in effect for one term. In-process students may register for no more than six credits without the approval of the Director of Graduate Admissions or the coordinator of the program for which they are applying.

It is the responsibility of in-process students to see to it that all materials in support of their applications are received by the Graduate School in time for an acceptance decision before the next term. In-process students will not be permitted to register for a second term until an acceptance decision has been made. Permission to register as an in-process student does not guarantee admission to the Graduate School.

Students who fail to register for three consecutive terms will no longer receive registration materials. It will be the responsibility of such students to notify the Graduate Records Office of their desire to continue graduate study. Files for students who revert to an inactive status will be retained for two years. At the end of that period, only a permanent record of credits earned is maintained.

Students may not add a course after the first week of class unless written permission of the instructor is received. A student may not withdraw from a course any time after the seventh scheduled class meeting without permission of the instructor. Course additions or withdrawals may be handled in person or by mail.

The university reserves the right to change class schedules or instructors at any time. It further reserves the right to cancel any course, and, in such cases, will refund full tuition to the students.

Students with an outstanding balance will not be permitted to register. Current students who register after the registration deadline will be assessed a late registration fee.

ACADEMIC POLICIES

Academic Honesty and Ethics

The policies of the University of New Haven require commitment to academic honesty and ethics. Violations of university standards for academic honesty (including plagiarism), whether in fact or in spirit, will usually be handled by the faculty member involved. However, if sufficient reason is found, violation may be grounds for dismissal from the Graduate School.

Students are expected to complete all course requirements on their own initiative, with no collaboration unless specifically authorized by the instructor. In addition, use of the work, ideas or knowledge of another person, publisher, company, government or organization must be properly identified by reference or footnote in all materials submitted by the student.

Students wishing to appeal the decision of a faculty member regarding academic honesty and ethics should contact the Office of the Dean of the Graduate School.

Access to Academic Records

Academic records are maintained on each student enrolled in the Graduate School. These records are housed in the Graduate Records Office, located in the Student Services Building. The following types of academic records are maintained: the application for admission and supporting documents such as test scores, transcripts of undergraduate and other prior study, letters of recommendation, registration forms, grade lists, course schedules, petitions filed by the student and any other documents or correspondence pertaining to the student's academic work.

The Graduate Registrar is responsible for controlling access to and disclosure of students' educational records. Students desiring to inspect or review their academic records should address a written, dated request to the Graduate Registrar.

Information regarding confidentiality, privacy and right of access to student records can be obtained from the Graduate Registrar.

Attendance

It is the responsibility of the student to meet all classes and to take all examinations as scheduled. Faculty have the right to require a standard of attendance, even if it conflicts with professional and job-related responsibilities of students. Students whose jobs require that they be absent from class must realize that it is their responsibility to determine whether such absence is permitted by the faculty member involved and to meet the professor's requirements for making up work missed, if the professor allows missed time to be made up.

Make-up Policy

Make-up examinations are a privilege extended to students at the discretion of the instructor, who may grant permission for make-up examinations to those students

who miss an exam as a result of a medical problem, personal emergency or previously announced absence. On the other hand, instructors may choose to adopt a "no make-up" policy.

A make-up test fee may be assessed when a student is permitted to make up an announced test during the term or to take an end-of-term exam at a time other than the scheduled time. In either case, the make-up examination fee will be paid by the student at the Business Office.

Academic Standards

Grading System

The Graduate School uses the following grading system:

Superior performance:
A+ = 4.30 quality points
A = 4.00 quality points
A- = 3.70 quality points

Good performance:
B+ = 3.30 quality points
B = 3.00 quality points
B- =2.70 quality points

Passing performance:
C+ = 2.30 quality points
C = 2.00 quality points
C- = 1.70 quality points

Failure:
F = Zero quality points

P = Zero quality points
Pass; carries credit hours toward the degree. Use generally limited to dissertation, thesis and Executive M.B.A. courses.
P+ = Zero quality points
Pass with distinction; carries credit hours toward the degree. Use limited to Executive M.B.A. courses.
S = Zero quality points
Satisfactory performance in a non-credit course.
U = Zero quality points
Unsatisfactory performance in a non-credit course.
W = Zero quality points
Withdrawal from a course
I = Zero quality points
Incomplete; see policy rules below regarding incomplete courses.
T = Zero quality points
Used for thesis students who have not completed work during the term in which they originally registered for the course. Students must complete the work within the time limit for completion of the degree.
AU = Zero quality points
Audit; indicates that a student registered for and attended a class, but received no credit toward any degree.

Some employers require that a letter grade (A+ through C-, or F) be awarded if a student is to receive tuition reimbursement. It is the student's responsibility, in a non-credit course, to inform the faculty member of the need for a letter grade.

The grading system displayed above, with plus and minus designations allowed, became effective beginning with the fall trimester 1987. Prior to that date, including the summer term 1987, plus and minus grades were not used.

Grade Reports

Reports of the final grade in each subject will be mailed to the student from the Graduate Records Office soon after the close of each term, providing all financial obligations have been met.

Incomplete Coursework

A grade of Incomplete (I) is given only in special circumstances and indicates that the individual student has been given permission by the instructor to complete the work for the course with the same instructor after the end of the trimester or term.

Master's-level students who receive a grade of I (Incomplete) should complete the work within three months after the end of the term in most cases. Master's-level students may have a time period specified by the instructor, and not to exceed one year, to complete the work required for the course and have a grade submitted to the Graduate

Registrar. An I grade that is not replaced within the one-year allotted time will remain as a permanent I (Incomplete) on the student's permanent record.

Doctoral students enrolled in 700-level courses who receive a grade of I (Incomplete) have a time period specified by the instructor, and not to exceed three months, to complete the work required for the 700-level course and have a grade submitted to the Graduate Registrar. At the doctoral level, an I grade that is not replaced within the three-month allotted time will remain as a permanent I (Incomplete) on the student's permanent record.

Quality Point Ratio

The academic standing of each student is determined on the basis of the quality point ratio (QPR) earned each term. Each letter grade is assigned a quality point value. These quality point values are shown in the preceding section describing the grading system.

The quality point ratio is obtained by multiplying the quality point value of each grade by the number of credit hours assigned to each course as listed in the catalog, then dividing the sum of the quality points earned by the number of credit hours attempted in courses for which a grade of A+ through C- or F is awarded.

A cumulative quality point ratio is obtained by calculating the quality point ratio for all courses taken at the University of New Haven which are part of the degree program.

Academic Probation

Any student whose cumulative quality point ratio (QPR) is below 3.00, a "B" average, will be considered to be on academic probation, and may be required to obtain permission from the program coordinator before registering for additional coursework. A student at the master's level whose cumulative QPR is below 2.70 after completion of 24 credits will be required to withdraw from the Graduate School. A doctoral student whose cumulative QPR is below 3.00 after completion of 12 credits of doctoral coursework will be subject to dismissal.

Appeals concerning required withdrawal from the Graduate School under these circumstances should be directed to the Dean of the Graduate School.

Repetition of Work

A student may repeat a course. The grade received in the second attempt would supersede the original grade in the computation of the quality point ratio (QPR) if the second grade is higher. Both grades remain on the transcript. The course may be used only once for credit toward the requirements for completion of the degree program. Repetition of work at the doctoral level is subject to limitations which are described elsewhere in this catalog.

Awarding of Degrees

The University of New Haven awards degrees twice a year, at commencements in January and in June. A cumulative quality point ratio of 3.00 and completion of all program and university requirements are required for graduation and the conferring of master's degrees from the Graduate School. All students must file a graduation petition form in order to have their names placed on the list of potential graduates.

A cumulative quality point ratio of 3.30 in doctoral coursework, satisfactory completion of the written and oral doctoral comprehensive examinations, followed by successful completion and defense of the doctoral dissertation are required for graduation and the conferring of the doctoral degree. All doctoral candidates must also file a graduation petition form in order to have their names placed on the list of potential graduates.

Students completing their degree requirements at the end of the fall term will receive their degrees in January. Students completing their degree requirements at the end of the winter term will receive their degrees at the June commencement. Students completing the requirements for their degrees at the end of the spring term or the summer session will receive their degrees the following January. Students completing the require-

ments for their degrees in July or August will receive formal statements that they have completed all degree requirements and that their diplomas will be awarded at the next commencement.

Petition for Graduation

Candidates for January commencement must file a petition with the Graduate Records Office no later than October 15, and for June commencement no later than March 1. Forms for this purpose are available in the Graduate School Office and in the Office of the Graduate Registrar. Payment of the graduation fee must accompany the petition.

Should a candidate not complete all the requirements for graduation before the deadline, after having filed the petition to graduate and paid the fee, the student will have to petition again at a later date. At that time, only the refiling fee will be charged.

All financial obligations to the university must be met prior to graduation.

Time Limit for Completion of Degree

A student must complete all the requirements for the master's degree or certificate within five years of the date of completion of the first course following formal application to the degree program. Any extension of the time limit for completion of the degree can be granted only by the Dean of the Graduate School after consultation with the appropriate program coordinator.

Students enrolled in the doctoral program must complete all coursework and pass the doctoral comprehensive examinations within five years of the date of completion of the first 700-level course in the doctoral program. The dissertation must be completed and successfully defended, and the doctoral degree requirements completed within eight years of the date of completion of the first doctoral course.

Residency Requirements

Degree programs have a 30-graduate-credit residency requirement, with the exception of the M.B.A./M.S.I.E. and M.B.A./M.P.A. dual degree programs which have a 60-graduate-credit residency requirement. Credits toward the residency requirement may be earned at the main campus or at the off-campus locations. All students should plan on taking at least some of their courses on the main campus. Credits applied toward the residency requirement for one graduate degree may not be counted toward the residency requirement for another graduate degree.

Full-Time Study

A full-time course of study at the master's level is defined as three courses in the current term. Required non-credit courses (A 600, E 600, EC 600, HR 600, QA 600, TT600) count toward full-time study. Under certain circumstances the department chair, the program coordinator and the Graduate School administration may approve a reduction in credits.

Full-time study at the doctoral level is defined as registration for a minimum of four and a maximum of six doctoral courses per academic year of three trimesters. For international students who are required to maintain full-time enrollment for their immigration status, full-time doctoral study is defined as two doctoral courses per trimester for a total of six doctoral courses per academic year. Such persons will continue to be considered full-time students as long as their dissertation adviser, department chair and/or the director of the doctoral program certify that the student is making satisfactory progress toward completion of the doctoral degree. (Part-time doctoral study consists of registration for an average of two doctoral courses per academic year).

A student who wishes to enroll for more than four courses in a given trimester must secure the permission of the program coordinator.

Full-time enrollment is possible in the following degree programs: accounting, business administration, community psychology, computer and information science, criminal justice, environmental engineering, environmental science, fire science, forensic science, hotel and restaurant management M.B.A.

concentration, industrial engineering, industrial/organizational psychology, industrial relations, occupational safety and health management, operations research, public administration, taxation, tourism and travel administration M.B.A. concentration, and the business administration/industrial engineering and business administration/public administration dual degrees. Each of the above may also be pursued on a part-time basis.

Part-Time Study

Part-time study at the master's level is defined as one or two courses in the current term. Half-time study at the master's level is defined as registration for two courses in the current term; registration for only one course is less than half-time study.

Part-time study at the doctoral level consists of registration for an average of two doctoral courses per academic year.

The electrical engineering and mechanical engineering programs and all certificates have limited scheduled offerings and, therefore, are generally pursued on a part-time basis.

International students with F-1 or J-1 immigration status may not matriculate in the electrical engineering or mechanical engineering programs, or enroll in study leading to any certificate because these are part-time only.

Transfer Credit

Transfer credit may be given for graduate courses taken at other regionally accredited institutions prior to matriculation at the University of New Haven, subject to the following conditions:

- the courses were at the graduate level;
- each grade was **B-** or better; and
- the course did not fulfill requirements for any other degree already earned by the student.

Graduate students currently matriculated at the university must secure written approval before taking courses at another institution if they plan to transfer that credit into their UNH programs. Course coordination forms are available in the Graduate School Office for this purpose. Transfer credits and coordinated course credits are not included in courses used to establish a student's QPR at the University of New Haven.

Waiver of Courses

Some programs permit waivers of core courses on the basis of undergraduate courses taken at accredited institutions. Waivers of elective courses are not permitted, nor are waivers based upon experience. In such cases, substitution of a more advanced course may be allowed.

For a course to be waived, a student must first secure the written approval of the program coordinator, the department chair or a faculty member acting for the chair in the department in which the waiver is requested.

Even if a waiver has been granted, a student who wishes to take a waived course for review or as a refresher course may do so.

Under certain circumstances, a student who has independent knowledge of a specific course may be given permission to take a crediting examination in lieu of taking the course. Permission to take a crediting examination must be granted by the student's department chair or program coordinator, the chair of the department offering the course and the Dean of the Graduate School. Additional information and permission forms are available from the Graduate School Office.

Prerequisites

Students are expected to meet the prerequisite requirements for each course taken. Exceptions must be approved by the course instructor and the student's adviser or program coordinator. *Credit may be denied to a student who takes a course without the prerequisites.*

Dropping/Adding a Class

A student who wishes to make a change in class schedule must complete a "drop card" or an "add card" or both. These are available from the Graduate Registrar's Office. Written permission of the instructor is required to add a class after the first class

meeting. If a student withdraws from a class after the first class meeting, the tuition refund policy is applied.

Comprehensive Examinations

Students who are required to take comprehensive examinations in order to complete their degree programs must obtain the appropriate comprehensive examination approval form(s) from the Graduate School, secure the necessary approvals and pay the required fees, if applicable. Students should confirm arrangements for comprehensive examinations with the program coordinator.

Research Projects and Independent Study

All academic programs leading to a degree require the completion of a thesis, a research or other special project, internship or comprehensive examination. Students must have the written approval of their advisers and department chairs prior to enrolling for project or internship credit on an individual basis. This is accomplished by completing the appropriate forms (available from the student's department or from the Graduate School and Graduate Records offices) and securing the required approvals.

Students preparing a research project or independent study should follow the guidelines presented in the *Thesis Manual: A Guide for the Preparation of Graduate Theses, Research Projects and Dissertations,* copies of which are on reserve at the library.

In addition to the project requirement described above, students may (in certain cases) enroll for independent study under the supervision of a faculty adviser. *A student may not register for more than two independent study courses within a degree program.* An independent study proposal must be approved by the student's adviser or program coordinator as well as the coordinator or chair of the department offering the course.

Thesis

Completion of a master's thesis is required for some academic degree programs; in other programs, the thesis is optional. A number of preliminary steps are required before registration for thesis will be accepted by the Graduate Registrar. The student completes the *Proposal for Thesis* form (available at the Graduate School Office), in which the proposed subject, the methodology and the hypotheses are described. The student secures the approval signature of a faculty member who will serve as adviser. The student also must secure the approval of the proposed thesis and the thesis adviser from the department chair and/or program coordinator and the Dean of the Graduate School. Only after the Graduate Registrar has received the approved form will the student be permitted to register for thesis.

A thesis will carry no fewer than six academic credits taken over no fewer than two academic terms. A preliminary draft must be presented to the adviser at least 75 days prior to commencement. Upon approval by the adviser and program coordinator, two final, unbound copies are presented to the Graduate School. A date and time will then be scheduled for the thesis defense before the student's thesis committee and the Dean of the Graduate School. Successful defense of the thesis must be completed at least three weeks prior to the date of commencement.

After the successful defense and the approval of the thesis by the Dean of the Graduate School, thesis credit is awarded and the thesis is deposited for binding at the university library where it becomes a part of the permanent collection. Additional copies of the thesis may be required by the department or the program coordinator.

For guidance in the preparation of theses, graduate students should consult the *Thesis Manual: A Guide for the Preparation of Graduate Theses, Research Projects and Dissertations,* copies of which are available in the Graduate School Office. Questions not resolved by the instructions should be settled in consultation with the adviser and by reference to a standard style manual. The Graduate School participates in the University Microfilm Masters Program, and outstanding theses will be awarded this recognition upon the recommendation of the adviser,

the program coordinator, or both.

Information regarding the preparation and defense of the doctoral dissertation may be found on page 68. Additional details are outlined in the *Thesis Manual: A Guide for the Preparation of Graduate Theses, Research Projects and Dissertations*, copies of which are available at the Graduate School Office or from the director of the doctoral program.

Academic Advising

It is the student's responsibility to select courses in accordance with prerequisites, the adviser's recommendations, the departmental plan of study (if required) and the requirements for the degree.

Students needing further explanation about program requirements or course sequencing should request academic advisement. Appointments for academic counseling should be scheduled through department advisers or program coordinators. Off-campus advisement sessions are held prior to each trimester.

A student is not required to file a formal plan of study with the Graduate School. It is the student's responsibility to meet the stated requirements for the degree.

Grievance Procedure

A formal policy for the handling of student grievances is available in the Graduate School Office.

Diversity Policy

The University of New Haven is committed to achieving a diverse and pluralistic community which reflects the multiracial and culturally diverse society in contemporary America.

The Diversity Committee has been established to guide the university in implementing this Diversity Policy. The university will work toward attracting and retaining a diverse faculty, staff and student body for the purpose of creating a pluralistic scholarly community. The Committee will assist the administration in the development and implementation of programs and policies that support an enriched educational experience for a diverse university community.

The University of New Haven does not discriminate in admissions, educational programs or employment against any individual on account of sex, race, color, religion, age, disability, sexual orientation, or national or ethnic origin.

TUITION AND FEES

The following are the University of New Haven tuition, fees and charges which will be in effect for the fall 1991 term. The university reserves the right, at any time, to make whatever changes may be deemed necessary in admission requirements, fees, charges, tuition, policies, regulations and academic programs prior to the start of any class, semester, trimester or session.

Master's Tuition

Tuition, per credit hour	$ 275
Tuition, per 3-credit course	825
Executive M.B.A. program	17,600
Non-credit course fee, per course	525
Auditor, per course	825
E 600, English Language Workshop	825

Master's Non-refundable Fees

Application fee	$ 50
Executive M.B.A. application fee	50
Auditor application fee	50
Continuing registration fee	25
Co-op registration fee, full-time	100
part-time	50
Graduate Student Council fee, per term	5
Graduation petition fee	50
Late filing fee, after March 1 (June), Oct. 15 (January)	100
Graduation refiling fee	50
Health insurance fee (per year, all full-time students)	50
International student acceptance fee.	50
Laboratory fee	85
Late payment fee (after scheduled due date)*	25
Late registration fee, current students	15
New international student fee (one-time fee)	100
Registration fee, per term	5
Senior professional certificate/ professional certificate fee (payable upon completion of program)	35
Transcript fee, first copy	free
Additional copies	4
Make-up examination fee	10
Comprehensive examination fee	150
Crediting examination fee	150

Sc.D. Program Tuition and Fees

Application fee (non-refundable)	$ 50
Tuition, per 700-level course	1,550
Dissertation tuition, per course	800
Registration fee, per term (non-refundable)	5
Graduate Student Council fee, per term (non-refundable)	5
Qualifying examination fee (where applicable)	150
Continuing registration fee	500

*A late fee plus 1 ½ percent per month penalty will be assessed on outstanding balances.

Payment

Tuition for graduate courses is due at registration. However, the university permits graduate students to pay tuition on an installment basis, paying one half with the registration form and the balance before the end of the first week of the term. All students who have not completed tuition payments by the end of the first week of the term will be assessed the late payment fee.

Students are responsible for payment of tuition to the university, even though they may be eligible for their employer's tuition reimbursement plan. Students are responsible for making their own arrangements with their employers for reimbursement.

The university withholds the giving of grades, the awarding of diplomas, the issuance of transcripts and the granting of honorable dismissal to any student whose account is in arrears.

The university accepts MasterCard and VISA.

Withdrawal

A student may withdraw from a course up through the seventh week of the trimester without a notation on the transcript. A withdrawal after the seventh week requires the agreement of the instructor and means a "W" is recorded on the student's transcript.

To be eligible for a cancellation or refund of tuition charges, students must formally notify the Registrar of their intention to withdraw by completing the university withdrawal form and submitting it to the Registrar by mail or in person. The date of the postmark on the mailed withdrawal forms, or the date of submission on those brought in person, determines the amount of the refund, if any, due the student.

Refunds

The refund policy for graduate students who withdraw from any course or from any program (with the exception of the Executive M.B.A.) is as follows: 100 percent cancellation of tuition upon formal withdrawal prior to the first regularly scheduled class meeting, 80 percent cancellation of tuition upon formal withdrawal prior to the second regularly scheduled class meeting, 60 percent cancellation of tuition upon formal withdrawal prior to the third regularly scheduled class meeting, 40 percent cancellation of tuition upon formal withdrawal prior to the fourth regularly scheduled class meeting, 20 percent cancellation of tuition upon formal withdrawal prior to the fifth regularly scheduled class meeting. No cancellation will be made after the fifth regularly scheduled class meeting. Any resulting credit balance will be refunded upon request.

The refund policy for the Executive M.B.A. program is as follows: For E.M.B.A. students who withdraw after completion of one module or less, one-half of the year's tuition will be cancelled.

Financial Assistance

The University of New Haven offers a comprehensive program of financial assistance to qualified students including assistantships, fellowships, need-based grants-in-aid, campus employment opportunities and student loans. Application procedures for financial assistance are detailed below.

Need-based financial aid programs are available to matriculated students who are U.S. citizens or nationals. Merit-based programs are open to all matriculated students.

Need-Based Programs (U.S. citizens or nationals only)

- **University of New Haven Graduate Grants-in-Aid** — Grant assistance is available from university resources for students demonstrating exceptional need.
- **College Work-Study** — Employment opportunities are available for qualified students in university academic and administrative offices. Students must be enrolled for a minimum of two courses per trimester to qualify.
- **Stafford Student Loans** — Stafford Student Loans (formerly the Guaranteed

Student Loan program) may be obtained by qualified students enrolled for at least two courses per trimester. Eligible students may borrow up to $7,500 per academic year with interest charges and repayment beginning six months after the borrower leaves school. Students can obtain an application for a Stafford Loan from any bank. The application form must be submitted to the Financial Aid Office. In addition, loan applicants must submit a full financial aid application.

Non-Need-Based Programs (U.S. citizens or nationals only)

- **Supplemental Loans for Students (SLS)** — Supplemental Loans for Students are loans designed to provide additional funds for educational expenses and, like Stafford Loans, are made by a lender such as a bank, credit union or savings and loan. Graduate students may borrow up to $4,000 per academic year. SLS loans may be borrowed in addition to the Stafford Loans. Unlike the Stafford Loans, borrowers do not have to demonstrate financial need, although they may have to undergo a credit analysis. For an application and further information, contact any local bank.

Merit-Based Programs (Open to all matriculated students)

- **Assistantships** — Assistantships are competitive appointments. Graduate assistants may work up to 20 hours per week and receive an hourly compensation as well as partial tuition support. Applications for assistantships are made in late spring for the following year. Applications and further information are available from the Graduate School Office. Appointments are made for the academic year, starting in September.

- **Fellowships** — Fellowships are competitive awards made to returning students on the basis of outstanding academic achievement. Recommendations for fellowships are solicited annually, and nominations are sought from the faculty. Students may nominate themselves by writing to the Dean of the Graduate School. Awards are made for the academic year, starting in September.

Application Process

Complete financial aid application materials must be submitted for consideration for financial assistance.

For students applying for *need-based* assistance, *all* documents listed below must be submitted by the following deadlines:

May 1 for the Fall trimester
October 15 for the Winter trimester
January 15 for the Spring trimester

International students and *fellowship recipients* are required to submit only a Graduate Financial Aid Status Form. *U.S. citizens who are assistantship recipients* are required to submit all documents listed below.

- **Graduate Financial Aid Status Form** — Available in the Financial Aid Office, this form must be completed and submitted to the Financial Aid Office by all students applying for any type of financial assistance.

- **Financial Aid Form (FAF)** — The FAF must be filed by all students applying for need-based aid, including Stafford Student Loans. Assistantship recipients are also required to file the FAF. Forms are available from the Financial Aid Office and must be submitted to the College Scholarship Service for processing by the deadline date.

- **Tax Documentation** — Students are required to submit a complete, signed copy of their federal income tax return (Form 1040) from the most recent tax year preceding the fall trimester. If married, the applicant must also submit a copy of the spouse's Form 1040; if filing as a dependent student, the applicant must submit a copy (or copies) of the parents' tax return(s) as well. If the student, spouse and/or parents did not and will not file a tax return, a Non-Tax Filer Form must be submitted in lieu of the tax

return. The Non-Tax Filer Form is available in the Financial Aid Office.

- **Financial Aid Transcripts** — A Financial Aid Transcript Form must be submitted for each college the student has attended previously, regardless of whether the student received financial aid while attending those institutions. The forms are available in the Financial Aid Office.

Refund Policy for Federal Loans

Students who withdraw from courses prior to the end of the fifth week of the trimester are entitled to a full or partial refund of tuition charges. In the event that a student receiving a refund has received federal student aid, including a Stafford Loan and/or the Supplemental Loans for Students (SLS), the following refund formula (dictated by federal regulations) would apply:

$$\text{Refund Amount} \times \frac{\text{Total Federal Financial Aid}}{\text{Total All Financial Aid}} = \text{Federal Share of Refund}$$

External Assistance Programs

- **Family Education Loan Program (FELP)** — FELP is a low-interest loan program administered by the Connecticut Higher Education Supplemental Loan Authority (CHESLA). Students must be enrolled at least half-time and may borrow from $2,000 – $20,000 per academic year at a fixed annual rate of 9.7 percent. Repayment can be up to 140 months with the option of paying interest only while in school. Applicants must be credit-worthy. For an application and further information call 1-800-252-FELP (in Connecticut) or (203) 522-0766.

- **People's Bank/University of New Haven Special Tuition Account** — Under this program students establish a line of credit with People's Bank. Once approved, the account number may be used for payment of direct UNH charges. The minimum credit line that may be requested is $500. The university subsidizes 7 percent of the annual percentage rate of 15 percent; thus, the student's interest rate is 8 percent. Applications are available from the Financial Aid Office or at the Graduate School.

Cooperative Education

Cooperative education programs at the University of New Haven provide an opportunity for students to combine or alternate periods of career-oriented, paid, full-time work assignments with their academic programs.

Co-op work assignments for graduate students are developed on an individual basis. This enables students to integrate the experiential learning of the workplace and the theoretical understanding of the classroom. Enrollment in the co-op program includes the opportunity to participate in resume writing and interview workshops.

Co-op employers include large corporations, small businesses, government agencies and nonprofit organizations. Most are in Connecticut and adjacent states, but co-op staff members can work with out-of-state students who would like work assignments at home.

Graduate students may take advantage of the co-op program as soon as they enroll at the university; however, work assignments will not be made until the student has completed nine credit hours of graduate study. Additional information is available from the Co-op Office.

STUDENT SERVICES

Athletics

Graduate students are encouraged to make use of the North Campus athletic complex. Facilities include two basketball courts, racquetball court, weight room with universal gym, fully equipped training room, six tennis courts, a softball field, Vieira Baseball Field and Dodds Stadium.

Graduate students are eligible to take part in the intramural competitions in touch football, badminton, basketball, racquetball, softball, tennis and volleyball.

Campus Store

The Campus Store provides all necessary texts, new and used, that are required for courses at the university. It also carries related supplies, greeting cards, imprinted clothing, gifts, candy and a selection of paperbacks, newspapers and periodicals. The Campus Store handles orders for class rings and school chairs. Film processing service is also provided for the campus community. Used text books may be sold back to the store throughout the year.

Students taking classes at an off-campus location may purchase their books at or near some of the off-campus sites. In addition, arrangements have been made for off-campus students to order books directly from the bookstore if using a credit card or paying by check. Books ordered in this way will be shipped to the student.

Career Development

The Career Development Office offers individual and group career counseling as well as special workshops on resume preparation, interviewing skills and job research techniques.

Although this office is not an employment service and does not guarantee jobs, extensive listings of both full-time and part-time positions are maintained to provide a common meeting ground for employers and prospective employees. Graduate students will find this useful in locating part-time and full-time jobs while in school, as well as for seeking employment following graduation. Alumni are also encouraged to use these services.

Employers wishing to list positions may contact the office by telephone or in writing, giving a description of the position available and other details. There is no placement fee charged for these services.

Career Development also assists students with questions regarding alternative career paths and maintains an extensive research library of career information, vocational resources, brochures and annual reports of employers.

The Career Development Office produces the career development section for the alumni newsletter, *Insight;* has a regular career section and calendar in *The Charger Bulletin;* and circulates a monthly job recruiting newsletter. These publications appear during the first week of every month throughout the academic year. Information on career

development events, workshops, seminars, recruitment visits, employment outlook for graduates, job listings and job search hints are included.

A recruitment schedule will be mailed to any member of the university community who wishes it and who provides the office with a supply of self-addressed envelopes for the number of months desired.

The Career Development Office is located on the upper level of the Student Center and is open weekdays from 8:30 a.m. to 4:30 p.m.

Computer Center

The Computer Center provides services for both administrative and academic functions at the university, with terminals throughout the campus linked to "mainframe-like" computers.

A DEC VAX 6220 is used for the university's management information system (MIS); it has a 32-bit processor, 64 megabytes of main memory with an ethernet controller, peripheral storage capacity of 1.2 gigabytes and the VMS operating system.

A Data General MV15000 is dedicated to academic support. It has a 32-bit processor, 64 megabytes of main memory and virtual address range of 4 gigabytes with peripheral storage of 1.4 gigabytes. The operating system is AOS/VS II with multiprogramming/multitasking capability and handles up to 255 concurrent processes. Currently, there are 72 VDT ports, a 600 lpm printer, several dot-matrix printers and a laser printer. Tubes for student use are spread throughout three clusters on the main campus, with the largest concentration located in Echlin Hall. There is also a cluster in Groton to support the university's Southeastern Connecticut branch activities; microcomputers are available there as well. In addition, the system supports four Tektronix raster graphics terminals with plotter and printer as well as a PC/Data General connect for up/down loading files. Software includes FORTRAN 77, Pascal, UNIX, APL, BASIC, COBOL, PL/1, RPG, DBMS, LISP and word processing; also available are SPSS and IMSL, GKS and IGL graphics packages, several financial data files and simulation packages for engineering and business.

Use of the academic Data General is available to all faculty and students. Technical assistance is available from student aides and from the full-time Computer Center staff at the user services area in Echlin Hall.

Additional computing facilities are provided by other departments. These include: a personal computer laboratory in Echlin Hall, maintained by the Institute of Computer Studies (ICS), which is available to all students; the Computer-Aided Engineering Center in Buckman Hall, maintained by the School of Engineering, which is available to upper-level engineering and computer science students; and the UNIX laboratory in Echlin Hall, maintained by the Department of Industrial Engineering and Computer Science for use by computer science majors.

One personal computer laboratory/classroom in Dodds Hall, maintained by the School of Business, and another laboratory in Maxcy Hall, maintained by ICS, are used for classroom presentations and exercises.

Counseling Center

The Counseling Center offers assistance and counseling to students with vocational and personal problems.

The Counseling Center also offers testing, including admissions, vocational interest and personality testing. A controlled testing center for the administration of the Miller Analogies Test (MAT) and for the reporting of scores to graduate schools is maintained by the Counseling Center.

For students who do not know where to go for help with a problem, the Counseling Center serves as a resource for information and direction.

Alumni

Students are eligible for membership in the UNH Alumni Association immediately upon graduation. There are currently more than 23,500 members.

Alumni Association members are entitled to certain privileges including use of the library, services of the Career Development

Office and special alumni course auditing rates. ID cards issued to association members soon after graduation entitle alumni to these and other offerings.

Insight, containing news of campus and alumni happenings, is mailed quarterly. Homecoming, an annual Scholarship Ball, estate planning seminars and other educational and social events offer opportunities for continued contact with UNH and fellow alumni.

Additional opportunity for active involvement with the association and students is provided through participation in the annual fundraising campaign as well as charter travel programs.

Alumni board members govern the association with the assistance of a council of additional alumni volunteers. The board and council serve as an advisory group to the university, working to strengthen bonds by promoting communication between alumni and the UNH community.

A major thrust of the Alumni Council is the promotion of the joint relationship of students and alumni. Students are seen as "alumni in matriculation," thus providing an additional link between the two groups. These efforts stimulate and increase student awareness of the valuable role of alumni in their lives and careers.

Development Office

The development staff works with the president of the university, the Board of Governors, faculty and staff to secure both short- and long-term funding for enhancement of the university's programs and facilities. Funds are sought for student financial aid, faculty development, equipment, library resources and other institutional opportunities for growth over and above what can be achieved from regular and anticipated university income.

National and local foundations, parents, students, alumni and friends support these efforts and contribute to the excellence of the university. Students play an active role, participating in fund-raising events and soliciting donations for the annual alumni fund.

Food Services

The Student Center building houses a cafeteria which serves a variety of hot entrees, sandwiches, beverages and a la carte items. The Charger Cafe, located on the main floor of the Student Center, is a pizza shop offering subs, pizza and beverages during the evening hours.

Several meal plan options are available for graduate students living on or near campus. Arrangements for meal plans may be made at the Food Services Office in the Student Center.

Graduate Student Council

The Graduate Student Council of the University of New Haven was founded in 1976. Since that time it has expanded its horizons through diverse programming and as a result of the increased enrollment of graduate students.

The Graduate Student Council is a student organization funded by the fee paid by all graduate students each trimester. Thus, all graduate students enrolled at UNH are automatically members and share in the activities of the council.

The purpose of the Graduate Student Council is to promote the welfare of the student body of the Graduate School, to give counsel and encouragement to all students in the Graduate School, to encourage the active participation of all graduate students in determination of their academic environment, to develop and encourage a school spirit among the graduate student body through social and other activities, and to convey student opinion to the university administration. The Graduate Student Council annually elects two of its members to serve as delegates to the university's Board of Governors.

The council serves as a cultural, social and educational organization through a variety of activities including annual symposiums and seminars, wine-and-cheese/coffee-and-doughnut informal gatherings and the biannual receptions for graduating students. The council also donates funds for graduate fellowships and

graduate student merit scholarships, gives a class gift to the university each year and provides other supportive services.

Students enrolled in the doctoral program participate in and sponsor special events in addition to the activities described above.

Health Services

The university's Health Services Center, located on the main campus, is open to all students without charge. The center is staffed by two registered nurses and two part-time physicians. A weekly women's clinic is staffed by nurse practitioners. Health Services provides initial care for minor illnesses and injuries as well as diagnosis, referral and follow-up care for more serious conditions. The center also is a resource for information about medical questions and other medical facilities in the community.

Housing/Residential Life

The Office of Residential Life has information on the availability of on-campus housing and provides a limited file of off-campus accommodations including apartments, houses and private rooms. Space for on-campus housing is extremely limited, but is available occasionally. However, graduate students should plan to find living accommodations in an apartment or house off campus.

Institute of Analytical and Environmental Chemistry

The University of New Haven Institute of Analytical and Environmental Chemistry is an applied research facility with capabilities in three general areas of chemical and environmental analysis: sample analysis, property measurement and custom synthesis. Administered by the nonprofit UNH Foundation and headquartered in the university's School of Engineering, the institute is a state-certified laboratory for the analysis of various water pollutants. In addition, it is equipped to measure the physical properties, stability and environmental impact of specific pollutants. The institute also has the capability to synthesize compounds, suspected pollutants and products to establish identification standards.

The institute is geared to accept specific projects, under contract, and perform the necessary research on a confidential basis using UNH equipment, laboratory facilities and staff. Clients most likely to seek these services include chemical companies, consulting firms, regulatory agencies and municipalities.

Institute of Computer Studies

The University of New Haven Institute of Computer Studies (ICS) is an academic organization merging people, ideas and resources to promote, enhance and support computer-related programs and activities at UNH. The institute complements and assists academic departments and other computing units at the university in promoting and developing innovative responses to emerging computing requirements. The institute also serves as a focal point for joining business and industry with the diverse education-related services, both credit and non-credit, of the university.

The University of New Haven has fostered the multifaceted development of computer science and computer-related courses in its schools. An increasing number of faculty and students are utilizing some aspect of computing. The institute was created from the recognition of this growing, multidisciplinary diversity of computer needs and applications in the university community to provide information and coordination in the development of these activities. The specific responsibilities which encompass the activities of the institute are to:

- provide coordination for the university's many computer-related activities and insure long-range planning of computer resources;
- provide and administer certain computer-related facilities and services, including a personal computer laboratory;
- assist industrial firms in assessing and satisfying their computer training requirements through the university's several divisions;

- assist departments in offering non-credit courses in computer-related areas;
- assist departments, when appropriate, in their development of new programs and courses;
- assist in directing students to computer-related programs appropriate to their needs;
- disseminate information concerning academic computing activities;
- serve as institutional liaison for certain computer-related projects and associations; and
- promote technological and applications research.

International Student Services

Each year the University of New Haven admits students from many nations. These students, representing more than 50 different countries, bring an international and intercultural dimension to the campus.

The International Services Office provides for the special needs and concerns of all international students. The office staff assists students with government regulations, provides information on travel in the United States and advises students on academic, social and cultural adjustment. The office also serves as a liaison between the student and the university community.

A wide range of programs has been developed including publication of an international newsletter, special orientation events, international banquets and information seminars.

Library

The Marvin K. Peterson Library, named in honor of the former president of the university, was opened in 1974. Adjoining Maxcy Hall, it includes special collection rooms, archives, and reading and reference areas. Study is made convenient by modern research facilities and equipment including microform reader-printers as well as computer terminals.

The library houses nearly 380,000 volumes. It contains collections of U.S. government documents, numerous corporate reports, pamphlet files, microforms, and 1,400 current periodical titles.

The library's resources can support comprehensive research for all graduate programs offered by the university. Access via OCLC provides nationwide information and interlibrary loan capability. The DIALOGUE and Dow Jones databases are also available.

Public libraries in New Haven and West Haven are accessible to UNH students (non-residents must pay a nominal fee). Students in the Groton-New London area have access to a substantial UNH collection housed in the UNH Center at the Groton Public Library, which also has access to OCLC and DIALOGUE as well as telefacsimile communications with the West Haven campus. Southeastern graduate students and faculty also have library privileges available at Connecticut College in New London. Students at the Waterbury location have access to a UNH collection and full library privileges at Teikyo Post University. Graduate students enrolled in classes at Middletown have limited library privileges at Wesleyan University, and a reciprocal arrangement allows students in the Fairfield County area access to the library at the University of Bridgeport. Doctoral students are provided with access to Yale University's library system, which is one of the nation's finest. Graduate students are expected to utilize the University of New Haven's collection at the main campus in West Haven for research and thesis preparation.

Office of Minority Affairs

The director of the Office of Minority Affairs represents the needs and interests of minorities at the University of New Haven. The staff also works closely with minority students to assist them academically, when requested, and to help them to maintain cultural pride and heritage. Social and cultural activities which are of special interest to minority students are also promoted.

Publications

Student publications include *The Charger Bulletin*, the university student newspaper,

and *The Chariot*, the annual yearbook. Students may volunteer to work on these student publications.

The University of New Haven Press (under the auspices of the Bureau of Business Research) publishes scholarly texts, monographs and the *American Business Review*, a biannual, refereed academic journal. Information regarding subscriptions and submission of manuscripts may be obtained from the Bureau of Business Research at the School of Business.

The University of New Haven also publishes *Essays in Arts and Sciences*, an interdisciplinary scholarly journal devoted to a broad range of interests including literature, the arts, the social sciences and the natural sciences. The journal has been published annually since 1971, with occasional additional issues on special topics. The journal's distribution includes approximately 500 cooperating college and university libraries.

Services for Students with Disabilities

The Office for Students with Disabilities handles all referrals regarding any student with a disability. The director provides guidance, assistance and information for students with disabilities and oversees the university's compliance with Section 504 of the H.E.W. Rehabilitation Act of 1973 and other governmental regulations.

All referrals and inquiries concerning any matters relating to students with disabilities, accessible facilities and/or reasonable accommodations should be directed to this office.

Veterans' Affairs

The university maintains an Office of Veterans' Affairs with a full-time administrator who handles support services for veterans attending the University of New Haven. Liaison with state and local veterans' organizations is maintained on a regular basis.

WNHU Radio

WNHU, the university's student-operated FM stereo broadcast facility, is operated by the Communication Department of the School of Business throughout the year on a frequency of 88.7 MHz at a power of 1,700 watts. This extracurricular enterprise, open to all undergraduate and graduate students, serves southern Connecticut and eastern Long Island with music, news and community affairs programming. The WNHU broadcast day consists of locally produced shows as well as various programs provided by several public networks.

Most WNHU activities in programming, business and engineering operations are performed by students in the university's day, evening and graduate divisions. The station personnel will train all qualified students in their respective areas of interest.

ACADEMIC PROGRAMS

Accounting

Coordinator: Robert G. McDonald, Associate Professor of Accounting, M.B.A., New York University; C.M.A., C.I.A., C.F.A., C.P.A.

The overall objective of the master of science in accounting program is to provide a framework for accounting inquiry, devised in structure and content from the entire scope and process of accounting-information-based economic decision making. The existence of such a framework is intended to provide graduate accountants and professional practitioners an opportunity to share in the development and assessment of issues of accounting interest within a decision-making context. Accordingly, the M.S. program is structured to receive its objective and direction from the overall objective of accounting—providing information useful to the process of economic decision making.

To accomplish this objective, the M.S. program offers a structure of studies designed to provide:

- an examination of the foundations of economic decision making (foundation courses, 18 credits);
- an analysis of the role and usefulness of accounting information for economic decision making (core courses, 18 credits); and
- an opportunity for further selected specialization from the generally recognized branches or divisions of accounting inquiry (electives, 6 credits).

Each student, upon entering the program, will be assigned a faculty adviser who will assist the student throughout the program of study, particularly with the selection of suitable electives. The assigned faculty adviser will also act as, or assist in the selection of, the student's thesis adviser.

Admission Policy

Candidates for admission to the program are expected to hold an undergraduate degree from an accredited institution, preferably, but not exclusively, in accounting or in business administration with a major in accounting. Persons holding other than the above degrees will be required to take a number of selected undergraduate courses. Admission is based primarily on an applicant's undergraduate record; however, the promise of academic success is the essential factor for admission. In support of their applications, persons may submit their scores from the Graduate Management Admission Test (GMAT). An applicant may be required to take this test.

M.S., Accounting

A total of 42 credits on the graduate level is required for the master of science in accounting. In addition, selected undergraduate courses in accounting may be required of students not holding an undergraduate

degree in accounting. Individual programs of study are determined after a conference with the coordinator.

Students are advised to consult the coordinator as soon as possible after matriculating in the program.

See page 78 for the senior professional certificate in accounting.

Thesis

All students are required to write a thesis. The thesis must show ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Required Courses

Foundation Courses
EC 603/Microeconomic Analysis
EC 604/Macroeconomic Analysis
FI 615/Finance
FI 651/Portfolio Management and Capital Market Analysis
MG 637/Management
QA 604/Probability and Statistics

Core Courses
A 616/Taxation for Management
A 621/Managerial Accounting, *or*
A 661/Managerial Accounting Seminar
A 650/Advanced Accounting Theory
A 654/Financial Statements: Reporting and Analysis
A 698-9/Thesis I and II
Electives (two courses)
Total Credits **42**

Elective Courses (Select any two courses from a specialization.)

Financial Accounting Specialization
A 651/Financial Accounting Seminar
A 652/Advanced Auditing
A 653/Accounting for the Not-for-Profit Organization
FI 649/Security Analysis

Managerial Accounting Specialization
A 641/Accounting Information Systems
A 642/Operational Auditing
A 661/Managerial Accounting Seminar
FI 645/Corporate Financial Theory

Taxation Specialization
A 601/Individual Income Taxation
A 602/Sales and Exchanges of Property
A 604/Corporate Income Taxation I

Business Administration

Coordinator: William R. Bockley, Professor of Management, Ph.D., Boston College

The purpose of the M.B.A. program is to educate men and women at the graduate level for careers in business administration as well as other areas requiring a sound grasp of business principles. Vital to this objective is the development of a management perspective enabling students to see the totality of management rather than the narrow concerns of the specialist.

The program has been designed to develop a professional point of view in managing an organization. It further develops the student's ability to utilize the newest analytic and quantitative techniques used in corporate decision making. The student is also exposed to an in-depth analysis of various theories of business and managerial behavior, emphasizing the business organization in relation to its internal and external environments.

Another important aspect of the program is to afford the student an opportunity to develop special skills by concentrating in a given study area.

Candidates for admission to the M.B.A. program are required to hold a baccalaureate degree from an accredited institution. Although admission decisions are based primarily on students' undergraduate academic records, applicants may submit scores from the Graduate Management Admission Test (GMAT) in support of their applications.

M.B.A.

A total of 48 credits, with or without a thesis, is required of candidates for the M.B.A. The curriculum consists of 12 required core courses and four elective courses. The total credits required may be reduced by waiver of *required* courses based on the student's undergraduate record or by transfer of credits from other accredited graduate programs. However, students must complete at least 30 graduate credits at the University of New Haven to be awarded the degree.

Completion of the elective portion of the program may be accomplished by selecting courses from a variety of areas, at least two of which must be from departments within the School of Business. Another option provides the opportunity for the student to develop special skills by concentrating the elective portion of the program in a specific area of study. The concentration options are described in the pages immediately following this section.

In appropriate cases having special approval, a student may elect to write a thesis. Candidates for the M.B.A. electing to write a thesis must register for a minimum of six thesis credits in the appropriate business department and would substitute these six credits of Thesis I and II for MG 690 and one elective course in the program. The thesis must show ability to organize material in a clear and original manner and must present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

In order to become fully matriculated in the M.B.A. program, students who are admitted *provisionally* must complete, with satisfactory grades as specified in the letter of acceptance, the following courses before enrolling in elective courses: QA604 and any three other required core courses for which the prerequisites have been met. (Refer to the course descriptions elsewhere in this catalog for course prerequisites.)

Students entering the M.B.A. program who lack adequate preparation in accounting, economics or quantitative techniques may be required to enroll in a maximum of three graduate-level, non-credit courses (A600 Accounting, EC600 Basic Economics, QA600 Quantitative Analysis) in order to satisfy prerequisite requirements. Adequate preparation is defined as satisfactory completion of the following undergraduate credits with grades of "C" or better: six credit hours of accounting, three credit hours of economics and six credit hours of quantitative techniques or mathematics.

Students in the M.B.A. program are expected to be familiar with, or become familiar with, the use of computers in solving problems. The use of a computer is required in a number of courses in the M.B.A. curriculum.

Required Courses

A 621/Managerial Accounting
EC 603/Microeconomic Analysis
EC 604/Macroeconomic Analysis
EC 625[1]/Industrial Relations
FI 615/Finance
IB 643/International Business
MG 637[2]/Management
MG 685[3]/Research Methods in Business Administration
MG 690[4]/Research Project
MK 609/Marketing
P 619/Organizational Behavior
QA 604/Probability and Statistics
Electives (four courses)
Total credits 48

[1]*Students enrolled in the finance concentration take either IB 643 (preferred) or EC 625 (with the adviser's approval); credit for only one of these two courses will be counted toward the M.B.A. degree with the finance concentration. Waiver of EC 625 does not excuse finance concentration students from taking the required course IB 643.*
[2]*Students enrolled in the health care management and the health care marketing concentrations take MG 640 in place of MG 637.*
[3]*Students enrolled in the finance concentration take FI 616 in place of MG 685.*
[4]*Students enrolled in the finance concentration take either FI 646 or FI 647 in place of MG 690.*

Waiver Policy

Required core courses in the M.B.A. program may be waived on the basis of undergraduate courses taken at accredited

institutions. Waivers will be considered at the time of the admission decision. Students who seek additional waivers must submit a written request (with a description of the previously completed coursework) to the M.B.A. coordinator, who will review and act on the waiver request. **Only courses with grades of "B" or better may be used in meeting waiver guidelines for the required courses. Only required core courses may be waived. No waivers will be granted for either MG 685 or MG 690.**

A course that has been waived may not be taken for or used for elective credits. No tuition refund or cancellation will be issued for courses taken and subsequently waived.

Waiver Guidelines

A 621: Twelve credit hours of accounting, including at least three credit hours of managerial/cost accounting.
EC 603: An intermediate microeconomics course, such as EC 340 at the University of New Haven.
EC 604: An intermediate macroeconomics course, such as EC 341 at the University of New Haven.
EC 625: A course in labor economics and/or labor-management relations.
FI 615: Undergraduate degree in finance or 12 credit hours of finance, of which at least six credit hours are in financial management.
IB 643: Six credit hours of international business, international marketing, international finance, or international economics.
MG 637: Nine credit hours of management.
MK 609: Nine credit hours of marketing, including three credit hours of marketing management.
P 619: Twelve credit hours in psychology, with at least six credit hours primarily concerned with topics such as attitude development and change, group processes, industrial psychology, organizational conflict and supervisory behavior.
QA 604: Six credit hours of quantitative analysis, business mathematics or college-level mathematics plus introductory-level and intermediate-level probability and statistics courses.

Concentrations

Within the M.B.A. program students may use the elective credits to concentrate their studies in a specific area. The available concentrations and their course requirements are listed below. Most concentrations consist of 12 credits. With the permission of the adviser, students may substitute other appropriate courses for those listed as part of the concentration. It is recommended, but not required, that concentrations be indicated on the application for admission to the M.B.A. program, or as soon as possible thereafter.

The concentrations in finance, health care management and health care marketing have special requirements which affect the required core curriculum. In addition, students enrolling in hotel and restaurant management and tourism and travel administration who lack appropriate academic backgrounds and/or industry experience will be required to take one basic overview course (HR 600 or TT 600) and/or complete a 500-hour practicum in their respective fields as part of their graduate programs. Students should consult the concentration descriptions and contact the appropriate adviser for additional information.

Concentration in Accounting

Concentration Adviser: Robert G. McDonald, Associate Professor of Accounting, M.B.A., New York University; C.M.A., C.I.A., C.F.A., C.P.A.

The concentration in the accounting program is recommended to those M.B.A. students who desire an accounting specialization but do not have an undergraduate accounting degree. Students who wish to take the Certified Public Accounting examination or the Certified Management Accounting examination should enroll in the M.S. in accounting program.

A 616/Taxation for Management
A 650/Advanced Accounting Theory
A 661/Managerial Accounting Seminar
Plus any accounting or taxation elective
Total credits 12

See page 78 for the senior professional certificate in accounting.

Concentration in Business Policy and Strategy

Concentration Adviser: Robert W. Baeder, Professor of Management, Ph.D., Ohio State University

The concentration in business policy and strategy is designed to prepare managers to deal with the increasing emphasis given by companies to the development and implementation of innovative global business strategies. The program focuses on strategic concepts and processes and relates them to general management and functional supervision. A grounding in formulation of business policy and strategy for both internal growth and growth by mergers and acquisitions is provided.

MG 655/Advanced Business Strategy
MG 669*/Advanced Business Policy

Plus two of the following:

FI 620/Working Capital Management and Planning
IB 652/Multinational Business Management
MG 638/Cost Benefit Management
MG 680/Current Topics in Business Administration
MK 638/Competitive Marketing Strategy
MK 643/Product Management
Total credits 12

**Students who have had appropriate prerequisites may substitute CO 643 Telecommunications Policy and Strategy for MG 669.*

Concentration in Computer and Information Science

Concentration Adviser: Roger G. Frey, Professor of Computer Science, Ph.D., Yale University

This concentration provides coverage of programming and systems with a business systems emphasis, preparing the student to carry out systems studies and to interact knowledgeably with programmers and computer systems specialists.

Students who have not had previous instruction in computer programming are required to complete CS 602 Computing Fundamentals (on an excess credit basis) before enrolling in the programming language courses in this concentration.

Option 1:
CS 605/COBOL Programming
CS 605B/Advanced Business Programming

Option 2:
CS 606/FORTRAN Programming
CS 606B/Advanced Technical Programming

Option 3:
CS 603/Pascal Programming
CS 620/Data Structures

Plus two of the following:

CS 616/Assembly Language
CS 622/Database Systems*
CS 624/Software Engineering*
CS 648/Computer Systems Analysis and Selection
IE 604/Management Systems
Total credits 12

**Prerequisites are CS 603 and CS 620 (Option 3).*

See page 79 for the senior professional certificate in computer and information science.

Concentration in Finance

Concentration Adviser: Edward A. Downe, Associate Professor of Finance, Ph.D., New School for Social Research

The goal of the finance concentration is to prepare individuals for the expanding sector of financial services and modern corporate financial management. The program stresses the understanding of the conceptual founda-

tions of finance and the use of analytic techniques. Special emphasis is placed on the implications and applications of these concepts and techniques.

Finance concentration students will take either IB 643 (preferred) or EC 625 (with the adviser's approval) in the required core curriculum; credit for only one of these two courses will be counted toward the M.B.A. degree with the finance concentration. Waiver of EC 625 does not excuse finance concentration students from taking the required course IB 643. Electives in this concentration are to be chosen in consultation with the finance adviser. It is strongly recommended that students contact the finance adviser as early as possible to plan the appropriate sequence of courses. A recommended course sequencing for students interested in preparing for the Certified Financial Analyst (C.F.A.) examination is available from the finance adviser.

FI 616/Applied Research Techniques for Financial Operations and Financial Market Analysis (this course to be taken in place of MG 685 in the core of the M.B.A. program)
FI 617/Financial Institutions and Capital Markets
FI 645/Corporate Financial Theory
FI 646/Advanced Capital Market Issues, *or* FI 647/Advanced Corporate Financial Management Issues (to be taken in place of MG 690 in the core of the M.B.A. program)
FI 651/Portfolio Management and Capital Market Analysis

*Plus two of the following**

A 654/Financial Statements: Reporting and Analysis
FI 619/Monetary and Central Banking Policy
FI 620/Working Capital Management and Planning
FI 644/International Financial Management
FI 649/Security Analysis
FI 655/Speculative Market Analysis
FI 661/Real Estate: Principles and Practices
FI 670/Selected Topics
FI 698/Thesis I*
FI 699/Thesis II*
Total credits **21**

**Candidates who elect not to write a thesis must substitute, with written approval, two elective courses. Elective courses are to be chosen in consultation with the finance adviser.*

See page 79 for the senior professional certificate in finance.

Concentration in Health Care Management

Concentration Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

The concentration in health care management is designed for those individuals currently in or those who anticipate a career in health care management. Courses are designed to provide students with the conceptual and practical skills necessary for the management of a health care organization.

MG 640/Management of Health Care Organizations (this course to be taken in place of MG 637 in the core of the M.B.A. program)

Plus four of the following:

PA 641/Financial Management of Health Care Organizations
PA 642/Health Care Delivery Systems
PA 643/Health and Institutional Planning
PA 644/Administration of Programs and Services for the Aged
PA 645/Health Care Economics and Finance
PA 646/Organization and Management of Long-Term Care Facilities
PA 647/Alternative Health Care Delivery Systems
PA 648/Contemporary Issues in Health Care
PA 670*/Selected Topics
PS 635/Law and Public Health
Total credits **12**

**PA 670 Selected Topics may be taken more than once.*

Concentration in Health Care Marketing

Concentration Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

The concentration in health care marketing is designed to provide students with the communications, marketing and public relations skills necessary to compete successfully as marketing professionals in a variety of health care environments. Students will be taught to identify and analyze variables which affect communication and public relations, to design health care marketing plans and to implement marketing strategy within health care organizations.

MG 640/Management of Health Care Organizations (this course to be taken in place of MG 637 in the core of the M.B.A. program)
CO 621/Managerial Communication
MK 638/Competitive Marketing Strategy
MK 641/Marketing Management

Plus one of the following:

CO 631/Public Information Dynamics
CO 632/Contemporary Public Relations Issues
Total credits **12**

Concentration in Hotel and Restaurant Management

See page 60 for program description and content.

Concentration in Human Resources Management

Concentration Adviser: Judith A. Neal, Associate Professor of Management, Ph.D., Yale University

This concentration is designed for the personnel professional or the individual in another field who aspires to work in personnel. It provides an overview of the field and an opportunity to study various subfunctions (such as training, industrial relations or compensation) in greater depth.

MG 645/Management of Human Resources
MG 678/Personnel Management Seminar

Plus two of the following:

EC 627/Economics of Labor Relations
EC 687/Collective Bargaining
MG 664/Organizational Effectiveness
MG 665/Compensation Administration
MG 679/Industrial Relations Seminar
P 627/Attitude and Opinion Measurement
P 628/The Interview
P 641/Personnel Development and Training
Total credits **12**

See page 81 for the senior professional certificate in human resources management.

Concentration in International Business

Concentration Adviser: Michael Kublin, Associate Professor of Marketing and International Business, Ph.D., New York University

This concentration is designed to prepare managers to deal with the latest methods of analysis related to international business. These include the basic techniques and skills, such as adapting to new political and cultural environments, which are not normally covered by traditional courses. It is strongly recommended that students contact the international business adviser as early as possible to plan the appropriate sequence of courses.

FI 644/International Financial Management

Plus three of the following:

EC 641/International Economics
IB 645/Comparative International Business Environments
IB 651/International Marketing
IB 652/Multinational Business Management
IB 660/East and Southeast Asian Business Systems

IB 661/Investment Strategies for Developing Countries
MG 660/Comparative Management
Total credits 12

See page 81 for the senior professional certificate in international business.

Concentration in Logistics

Concentration Adviser: Alexis N. Sommers, Professor of Industrial Engineering, Ph.D., Purdue University

Although an old field of study traditionally associated with the military, logistics has emerged as an important management specialty in organizations dealing with complex systems and large, multiphase projects. Logistics is the modern science of making sure that needs are met when they occur, at a reasonable resource expenditure. This necessitates customer requirements planning, design-to-cost concepts, optimal system acquisition, life cycle analysis, transportation and distribution, and field support networks. Especially in defense industries, logistics is essential in designing, acquiring and introducing new weapons systems, new communication and supply systems and advanced production and distribution concepts. The logistics concentration provides a basic working knowledge of the discipline and gives a background for certification in the area.

LG 660/Logistics Technology and Management

Plus three of the following:

IE 615/Transportation and Distribution
LG 663/Logistics Management in the System Acquisition Process
LG 665/Integrated Logistics Support Analysis
LG 669/Life Cycle Cost Analysis
MG 638/Cost Benefit Management
Total credits 12

See page 89 for the professional certificates in logistics.

Concentration in Long-Term Health Care

Concentration Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This program is approved by the Department of Health Services, State of Connecticut, as a course of study in long-term health care. Students who complete these concentration courses are eligible to take the state licensing examination for long-term care administration, preparing individuals for participation in this area of expanding opportunities for health care practitioners.

In the following sequence, PA 646 must be taken before or concurrently with PA 681; PA 682 must be taken after PA 681 and PA 646. No waivers, substitutions or transfer credits will be permitted in this concentration.

PA 641/Financial Management of Health Care Organizations
PA 646/Organization and Management of Long-Term Care Facilities
PA 681/Long-Term Health Care Internship I
PA 682/Long-Term Health Care Internship II
Total credits 12

Concentration in Management and Organization

Concentration Adviser: Abbas Nadim, Associate Professor of Management, Ph.D., University of Pennsylvania

The concentration in management and organization is designed to develop students' conceptual knowledge and skills in formulating corporate strategy. The program focuses on concepts and processes useful in relation to general management and functional responsibilities in coordinating and directing the organizational effort in our ever-changing and complex economic environment.

Any four of the following:

LA 673/Business Law I: Contracts and Sales
MG 638/Cost Benefit Management
MG 645/Management of Human Resources
MG 655/Advanced Business Strategy
MG 660/Comparative Management
MG 661/Development of Management Thought
MG 662/Organization Theory
MG 663/Leadership in Organizations
MG 664/Organizational Effectiveness
MG 669/Advanced Business Policy
MG 680/Current Topics in Business Administration
Total credits 12

See page 80 for the senior professional certificate in general management.

Concentration in Management Science

Concentration Adviser: William Pan, Professor of Quantitative Analysis, Ph.D., Columbia University

This concentration gives the student the quantitative knowledge and skills needed by managers in changing technologically oriented organizations. It reinforces and improves the manager's information processing and decision-making skills.

Any four of the following:

EC 653/Econometrics
IE 601/Introduction to Operations Research/Management Science
IE 604/Management Systems
MG 638/Cost Benefit Management
QA 606/Advanced Management Science
QA 607/Forecasting
Total credits 12

See page 80 for the senior professional certificate in general management.

Concentration in Marketing

Concentration Adviser: David J. Morris, Jr., Associate Professor of Marketing, Ph.D., Syracuse University

The concentration in marketing allows the student to develop analytic skills and a deeper understanding of marketing phenomena. Specific emphasis is given to the development of content knowledge and skills necessary for operating managers of the marketing function.

MK 639/Marketing Research and Information Systems
MK 641/Marketing Management

Plus two of the following:

IB 651/International Marketing
MG 669/Advanced Business Policy
MK 616/Buyer Behavior
MK 638/Competitive Marketing Strategy
MK 643/Product Management
MK 645/Distribution Strategy
MK 670/Selected Topics
MK 680/Marketing Workshop
Total credits 12

See page 81 for the senior professional certificate in marketing.

Concentration in Operations Research

Concentration Adviser: Ira H. Kleinfeld, Professor of Industrial Engineering, Eng.Sc.D., Columbia University

Operations research involves the application of quantitative methods to problem solving in business and industry and in matters of public policy. These courses cover several of the most widely used techniques of operations research.

IE 607/Probability Theory
IE 621/Linear Programming
IE 622/Queueing Theory
IE 686/Inventory Analysis
Total credits 12

Concentration in Public Relations

Concentration Adviser: Jerry L. Allen, Professor of Communication, Ph.D., Southern Illinois University

The concentration in public relations is designed to orient managers to and prepare public relations practitioners for the many demands placed on public and private corporations and state and local governments. The program focuses on theory, media relations and contemporary issues affecting business and the public.

CO 621/Managerial Communication
CO 631/Public Information Dynamics
CO 632/Contemporary Public Relations Issues

Plus one of the following:

CO 601/Basics of Business Media Production Techniques
CO 609/Scripting the Media Presentation
EC 629/Public Policies Toward Business
MG 680/Current Topics in Business Administration
MK 639/Marketing Research and Information Systems
P 638/Psychology of Communication and Opinion Change
Total credits 12

Concentration in Telecommunications

Concentration Adviser: Jerry L. Allen, Professor of Communication, Ph.D., Southern Illinois University

The concentration in telecommunications management is designed to prepare managers to deal with this fast-changing, high-technology field in positions with end users of telecommunications equipment, competitive long-distance common carriers or regulated local-exchange telephone companies. The program focuses on concepts and processes useful in relation to general management and functional supervision, while providing a grounding in the broad business aspects of the field.

CO 640*/Communication Technologies
CO 642/Management of Telecommunication Organizations
CO 643/Telecommunications Policy and Strategy

Plus one of the following:

CO 621/Managerial Communication
CO 641/Competition and Regulation in Telecommunications
CS 642/Computer Networks and Data Communication
LA 673/Business Law I: Contracts and Sales
MG 638/Cost Benefit Management
MG 680/Current Topics in Business Administration
Total credits 12

**Students who have had the equivalent of CO 640, either through work experience or educational courses given by a common carrier, may substitute another course from the elective list subject to the approval of the concentration adviser.*

Concentration in Tourism and Travel Administration

See page 76 for program description and content.

Business Administration/ Industrial Engineering Dual Degree Program

Coordinator: Ira H. Kleinfeld, Professor of Industrial Engineering, Eng.Sc.D., Columbia University

The Graduate School has always encouraged interdisciplinary studies. To foster a broader expertise in the areas of business administration and industrial engineering, a student can earn degrees in both fields by successfully completing this dual degree

program.

The program is intended for students with undergraduate engineering or technical degrees from programs accredited by the Accreditation Board for Engineering and Technology. Applicants with degrees in fields other than industrial engineering will be required to take a number of undergraduate courses or otherwise demonstrate proficiency in several areas normally included in an industrial engineering program.

M.B.A./M.S.I.E. Dual Degree

The M.B.A./M.S.I.E. program consists of 72 credit hours. Up to 12 of these credit hours may be waived on the basis of undergraduate course work, leaving a minimum requirement of 60 credit hours. All waivers must be approved in writing by the appropriate department and are conditional upon subsequent academic performance. Graduate credit may be transferred from other accredited institutions subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

In all cases, the residency requirement for the two degrees shall be 60 credit hours completed at the University of New Haven.

Research Project/Thesis Requirement

All students in the dual degree program must complete the required business administration MG 690 Research Project course listed in the program. In addition, all dual degree students must complete an industrial engineering special project or thesis within the elective portion of the program. The industrial engineering special project requirement may be satisfied by taking a project course in a group setting when these are offered. A designated area of study may be indicated for each such industrial engineering project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those individuals intending to complete a project. In appropriate cases having special approval, a student may take a Research Project or Thesis (as listed in the catalog) on an individual basis.

Required Courses

A 621/Managerial Accounting
CS 606/FORTRAN Programming
EC 603/Microeconomic Analysis
EC 604/Macroeconomic Analysis
EC 625/Industrial Relations
FI 615/Finance
IB 643/International Business
IE 601/Introduction to Operations Research/Management Science
IE 607/Probability Theory
IE 609/Descriptive and Inferential Statistics
IE 623/Decision Analysis
IE 624/Quality Analysis
IE 651/Human Engineering I
IE 655/Manufacturing Analysis
IE 681/System Simulation
IE 686/Inventory Analysis
IE 688/Design of Experiments
MG 637/Management
MG 685/Research Methods in Business Administration
MG 690/Research Project
MK 609/Marketing
P 619/Organizational Behavior, *or*
P 620/Industrial Psychology
Approved Electives (two courses)
Total credits 72

Business Administration/ Public Administration Dual Degree Program

Coordinator: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

The M.B.A./M.P.A. dual degree program is designed for those students whose interests or career objectives are focused at both the public and private sectors of the econo-

my. The program broadly stresses the use of management skills and analytic techniques applied to business, industrial, governmental and not-for-profit organizations.

M.B.A./M.P.A. Dual Degree

The M.B.A./M.P.A. program consists of 72 credit hours. Up to 12 of these credit hours may be waived on the basis of undergraduate coursework, leaving a minimum requirement of 60 credit hours. All waivers must be approved in writing by the appropriate department and are conditional upon subsequent academic performance.

Graduate credit may be transferred from other accredited institutions subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. In all cases, the residency requirement for the two degrees shall be 60 credit hours completed at the University of New Haven. In addition, a minimum of 21 credit hours must be earned in business courses and a minimum of 21 credit hours must be earned in public administration courses.

Thesis

All students must write a thesis. The thesis must show ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Required Courses

A 621/Managerial Accounting
EC 603/Microeconomic Analysis
EC 604/Macroeconomic Analysis, *or*
EC 608/Economics for Public Administrators
EC 625/Industrial Relations
FI 615/Finance
IB 643/International Business
MG 637/Management
MK 609/Marketing
PA 601/Principles of Public Administration
PA 602/Public Policy Formulation and Implementation
PA 604/Communities and Social Change
PA 611/Research Methods in Public Administration
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 625/Administrative Behavior, *or*
P 619/Organizational Behavior
PA 632/Public Finance and Budgeting
QA 604/Probability and Statistics
Public Administration Electives (three courses)
Business Electives (three courses)
Thesis I and II
Total credits 72

Community Psychology

Coordinator: Robert J. Hoffnung, Professor of Psychology, Ph.D., University of Cincinnati

Community psychology applies the theories and techniques of psychology and related social sciences to understanding and modifying the complex social forces which influence individual and community well-being.

Accordingly, the M.A. program in community psychology provides broad training in current approaches to preventing and treating psychological distress at the level of social institutions, organizations and groups rather than just the individual. Methods of community analysis, consultation and crisis intervention are considered as well as program development, administration and evaluation.

Classroom study is closely integrated with supervised field experiences in a variety of human service organizations and community settings.

Graduates are able to assume positions of responsibility in a broad range of human service settings, such as mental health programs, youth service bureaus, community houses, child development programs, municipal services, halfway houses, senior citizen centers, private agencies, health care systems and community action programs.

Admission Policy

An undergraduate degree from an accredited institution is required. A major in psychology is preferred but not required. However, all students are expected to have at least an introductory-level understanding of psychological concepts, principles and methods before entering. Students who have not had an undergraduate course in statistical methods will be required to take one before entry into P 609. Related work experience as well as academic performance is considered in admission decisions.

Along with the application materials required by the Graduate School, applicants may be asked to submit a questionnaire. Applicants may be required to submit scores from either the Miller Analogies Test or the Graduate Record Examination Aptitude Test, at the discretion of the department. Students intending to go on for further graduate work are strongly encouraged to take the GRE early in their first year of study in the master's program.

Fieldwork and Seminars

Supervised field experience in a variety of settings is a major vehicle through which students in the program develop applied skills. Students plan their fieldwork activities in collaboration with both the program's field training director and their supervisors from the field setting. Field experience is provided in the areas of individual intervention, consultation and systems intervention. Students with a year or more of appropriate full-time human service experience in a particular fieldwork area will be allowed to substitute an elective course for the fieldwork course in that area, contingent upon the approval of the community psychology program coordinator.

In addition to the fieldwork, three separate seminar courses provide a theoretical and research framework within which the development of these applied skills will be examined and discussed. These seminars enable students to conceptualize the issues encountered in the field within a broader context. A comprehensive project report is required in which the student will analyze and integrate fieldwork experience with relevant research and coursework.

Thesis

Students may elect to write a thesis as part of the program of study. The thesis must show ability to organize materials in a clear and original manner and present well-reasoned conclusions. A thesis is strongly recommended for students wishing to pursue doctoral training after graduation. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

M.A., Community Psychology

The program consists of 42 credit hours, 21 of which comprise the core curriculum completed by all students and 12 of which constitute one of three areas of concentration. Typically, students complete most of the core requirements before focusing on the concentrations.

Required Courses

P 605/Survey of Community Psychology
P 609/Research Methods
P 610/Program Evaluation
P 612/Consultation Seminar
P 615/Consultation Fieldwork
P 611/Individual Intervention Seminar, *or*
P 613/Systems Intervention Seminar
P 614/Individual Intervention Fieldwork, *or*
P 616/Systems Intervention Fieldwork
Electives (three courses)
Concentration (four courses)
Total credits 42

Concentration in Community-Clinical Services

The community-clinical services concentration is designed to prepare students for careers in clinical, mental health and related human service settings. Direct work with individuals within the social and community contexts in which they live as well as consultation, social problem analysis, and

prevention techniques and strategies are stressed.

P 625/Life Span Developmental Psychology
P 628/The Interview
P 629/Introduction to Psychotherapy and Counseling
P 632/Group Dynamics and Group Treatment
Total credits 12

Concentration in Mental Retardation Services

The concentration in mental retardation services is designed to prepare professionals who will work in public or private residential facilities for mentally retarded adults. Training in life skills through the use of behavior modification techniques is an important part of such work, and the concentration provides intensive training in behavior modification in two courses and in the two fieldwork experiences.

P 621/Behavior Modification I: Principles, Theories and Applications
P 622/Behavior Modification II: Advanced Theory, Assessment and Application in Mental Retardation Settings
P 625/Life Span Developmental Psychology
P 637/Mental Retardation: History, Theory and Practice
Total credits 12

See page 90 for the professional certificate in mental retardation services.

Concentration in Program Development

The program development concentration is designed to prepare students for careers which emphasize the administration of traditional and nontraditional programs and services. The concentration involves planning, development and evaluation of innovative approaches to treatment and prevention at the community, organizational and social systems levels in the public and private human service sectors as well as in business and industry.

P 619/Organizational Behavior
P 628/The Interview
PA 604/Communities and Social Change
PA 641/Financial Management of Health Care Organizations, *or*
PA 643/Health and Institutional Planning
Total credits 12

Computer and Information Science

Coordinator: Roger G. Frey, Professor of Computer Science, Ph.D., Yale University

This program provides advanced professional training in computer and information science, and offers to students a diversity of subject matter through its concentrations as well as through a wide range of course offerings. Its broad scope recognizes the rapid development of computing disciplines and applications, and allows students to prepare for this. The program can be used to enter, or advance in, the computing profession or an allied field, along a variety of career paths. It may also be used to prepare for further graduate study.

Excellent computing facilities are available for use by students in the program. In addition to the resources of the university's Computer Center and personal computer laboratory, students enrolled in the computer science program and courses may use the computing facilities of the School of Enigneering Computer-Aided Engineering Center as well as the computer science and engineering microcomputer laboratory.

M.S., Computer and Information Science

The program consists of 48 credit hours of coursework. This may be reduced in some situations through waivers or transfer credits, in conformity with Graduate School and program policies. The six core courses are eligible for waiver; concentration courses and electives may not be waived, but transfer credit and substitution may apply.

Candidates needing more background may be advised or required to take additional courses. In particular, CS 602 Computing Fundamentals is often used for this purpose; this course may be counted as a free elective within the program. Other courses added in this manner normally will have to be taken in addition to the program requirements.

The Pascal programming language will be the common teaching language used throughout the program. Use of, and programming in, Pascal may be required in all but the most introductory courses.

A core of six courses is required of all students in the program. Five more courses are taken in a concentration. A student must take courses that will satisfy one of the program's concentrations, but a formal declaration of concentration is not required until the student petitions to graduate. The remaining five courses in the program are electives: three restricted electives and two free electives. A project, as described below, must be completed as part of the program coursework.

In general, students are free to select their own courses in conformity with program requirements and course prerequisites, which should be followed carefully. It should be noted that the Graduate School may deny credit for a course taken without first satisfying its prerequisites, unless prior written approval has been obtained.

The graduate coordinator will evaluate the content of selected topics, independent studies, seminar project courses and new course offerings and will maintain a current list of such computing-related courses suitable as restricted electives in the program.

Free electives courses are taken from the set of graduate courses at the University of New Haven and should bear a reasonable relation to the student's overall program and career objectives.

Project/Thesis Requirement

Within the program's 16 courses, a student must complete a thesis or an appropriate special project. The special project requirement may be satisfied by taking a project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those individuals intending to complete a project. In appropriate cases having special approval, students may elect to write a thesis or take a project course (as listed in the catalog) on an individual basis; generally, however, the project course given in a group setting will be used to meet the project requirement. A form certifying that the project requirement has been satisfied must be submitted to the Graduate Records Office upon completion.

Required Courses

CS 603/Pascal Programming
CS 616/Assembly Language
CS 620/Data Structures
CS 622/Database Systems
CS 624/Software Engineering
M 610/Fundamentals of Calculus
Concentration (five courses)
Restricted Electives (three courses)
Free Electives (two courses)
Total credits **48**

The project requirement must be completed within the above 48 credits of required coursework.

Restricted Electives

Restricted electives include all courses listed in any of the concentrations (or their course classifications) and the following:

CS 622B/Advanced Database Systems
CS 670*/Selected Topics
CS 690*/Project
CS 695*/Independent Study I
CS 696*/Independent Study II
EE 640/Computer Engineering
EE 670*/Selected Topics
IE 614/Data Information Systems
IE 623/Decision Analysis
M 670*/Selected Topics

**Graduate coordinator must approve these courses for use as restricted electives.*

Concentration Course Classifications

The following classification of courses is used in the definitions of the three program concentrations.

Advanced Computing Applications Courses
CS 621/Applied Algorithms
CS 650/Computer Graphics
CS 650B/Advanced Computer Graphics
CS 660/Artificial Intelligence
CS 662/Expert Systems
CS 664/Neural Networks
IE 681/System Simulation

Computer Structures and Systems Courses
CS 640/Computer Organization
CS 642/Computer Networks and Data Communication
CS 646/Data Parallel Programming
EE 615/Introduction to Computer Logic
EE 658/Microprocessors—Theory and Applications

Computing Theory Courses
CS 630/Computing Theory
CS 632/Theory of Algorithms

Analytic Methods Courses
IE 607/Probability Theory
IE 609/Descriptive and Inferential Statistics
IE 621/Linear Programming
IE 622/Queueing Theory
IE 625/Advanced Mathematical Programming
IE 685/Theory of Optimization
IE 687/Stochastic Processes
M 615/Linear Mathematics and Combinatorics
M 616/Applied Modern Algebra for Computer Science
M 620/Numerical Analysis
M 624/Applied Mathematics
M 632/Methods of Complex Analysis

Programming Language Courses
CS 604/APL Programming
CS 605/COBOL Programming
CS 605B/Advanced Business Programming
CS 606/FORTRAN Programming
CS 606B/Advanced Technical Programming
CS 607/LISP Programming
CS 610/C Language Programming
CS 612/Ada Programming

Systems Software Courses
CS 636/Structure of Programming Languages
CS 638/Compiler Design
CS 644/Operating Systems
CS 644B/Advanced Operating Systems

Concentrations

Concentration in Applications Software

The concentration in applications software focuses on skills needed for the design and implementation of software for the end user in a broad range of application areas.

One Computing Theory course
One Programming Language course
One Analytic Methods course
One Advanced Computing Applications course
One Systems Software course
Total credits **15**

Concentration in Management Information Systems

The concentration in management information systems is designed primarily for data system managers, systems analysts and others involved with the integration, management or executive oversight of computing systems in organizations.

One Computing Theory course
One Programming Language course
One Advanced Computing Applications course

Plus the following:

CS 648/Computer Systems Analysis and Selection
IE 601/Introduction to Operations Research/Management Science
Total credits **15**

Concentration in Systems Software

The concentration in systems software is intended for the individual interested in the software which comprises the computing system itself and those programs closely associated with the system, such as language translators.

One Computing Theory course
One Programming Language course
One Computer Structures and Systems course

Plus the following:

CS 638/Compiler Design
CS 644/Operating Systems
Total credits 15

Criminal Justice

Coordinator: William M. Norton, Associate Professor of Criminal Justice, Ph.D., Florida State University; J.D., University of Connecticut Law School

A key objective of the master of science in criminal justice program is the training and education of men and women planning careers in the field of criminal justice as well as the advanced training and education of those who staff the agencies and institutions of the criminal justice system.

The program stresses a broad understanding of the social and behavioral sciences, the institutions of the criminal justice system and the development of methodological tools and skills.

The courses in the area of social and behavioral science stress the theories of the behavior of man in a social order and the sanctions imposed by different societies to control the social behavior of their members. Courses in the area of criminal justice institutions stress the study of the existing system from the police through the courts, the penitentiaries and the system of probation and parole. The methodological courses expose students to the tools of research and analysis and the contribution of systems analysis to the efficient administration of the criminal justice system.

M.S., Criminal Justice

A total of 45 credit hours is required of candidates for the degree of master of science in criminal justice.

Candidates must complete the core curriculum. After consultation with an adviser, students select electives from approved courses in the departments of criminal justice, economics, psychology, political science, sociology, industrial engineering and management science.

The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Thesis

Students may elect to write a thesis in lieu of CJ 690-1 Research Project and three credits of elective coursework. Registration for a minimum of six thesis credits (CJ 697, CJ 698) would be required. The thesis must show ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Required Courses*

CJ 601/Seminar in Interpersonal Relations
CJ 605/Social Deviance
CJ 610/Administration of Justice
CJ 637/Contemporary Issues in Criminal Justice
CJ 651/Problems in the Administration of Justice
CJ 690-1/Research Project (3 credits)
PA 611/Research Methods in Public Administration
Approved Electives (eight courses)
Total credits 45

**As an alternative to the program listed above a student may select one of the following three concentrations.*

Concentrations

There are three concentrations—correctional counseling, criminal justice management and security management—from which students may choose more specialized programs.

Concentration in Correctional Counseling

This program, offered jointly between the criminal justice program and the department of psychology, is designed for those individuals currently in correctional counseling positions or those who anticipate a career in correctional counseling.

CJ 601/Seminar in Interpersonal Relations
CJ 610/Administration of Justice
CJ 624/Group Process in Criminal Justice
CJ 690-1/Research Project (3 credits)
CJ 693/Criminal Justice Internship I
P 605/Survey of Community Psychology
P 611/Individual Intervention Seminar
P 628/The Interview
P 629/Introduction to Psychotherapy and Counseling
Criminal Justice Electives* (three courses)
Psychology Electives* (three courses)
Total credits **45**

**Electives will be chosen by consent of adviser. Students may be required to take CJ 694 Internship II, depending upon experience, ability and background.*

Concentration in Criminal Justice Management

This concentration is designed for those individuals wishing to pursue a career in the management of a criminal justice agency. Courses are offered jointly between the criminal justice and the public administration programs.

CJ 601/Seminar in Interpersonal Relations
CJ 605/Social Deviance
CJ 610/Administration of Justice
CJ 612/Criminal Justice Management
CJ 651/Problems in the Administration of Justice
CJ 690-1/Research Project (3 credits)
PA 602/Public Policy Formulation and Implementation
PA 604/Communities and Social Change
PA 611/Research Methods in Public Administration
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 632/Public Finance and Budgeting
Approved Electives (four courses)
Total credits **45**

Concentration in Security Management

Concentration Advisor: David Maxwell, Professor of Criminal Law and Justice, M.A., John Jay College; J.D., University of Miami

This concentration is designed for those individuals who are pursuing or wish to pursue careers in security management within business or industry. Coursework stresses broad interaction among the areas of security, business administration, fire science and criminal justice.

CJ 601/Seminar in Interpersonal Relations
CJ 605/Social Deviance
CJ 612/Criminal Justice Management
CJ 614/Survey of Forensic Science
CJ 669/Dynamics, Evaluation and Prevention of Structural Fires
CJ 675/Private Security Law
CJ 676/Security Management Seminar
CJ 677/Private Security in Modern Society
CJ 690-1/Research Project (3 credits)
SH 602/Safety Organization and Administration
Approved Electives (three courses)

Plus two of the following:

CJ 637/Contemporary Issues in Criminal Justice
EC 625/Industrial Relations
EC 687/Collective Bargaining
PA 625/Administrative Behavior
Total credits **45**

Electrical Engineering

Coordinator: Gerald J. Kirwin, Professor of Electrical Engineering, Ph.D., Syracuse University

The master's program in electrical engineering is intended to meet the needs of practicing engineers and scientists for academic work beyond the baccalaureate level. It has been designed to deepen the understanding of analysis and design techniques as they apply to modern engineering systems. A major goal of the program is to provide discussions of newly emerging technologies and design procedures.

Five required courses, broadly based in mathematics and systems concepts, serve as a common foundation on which the remaining components of the program rest. Students are encouraged to select their additional courses from a series of offerings which provides coverage of the major areas of current interest to electrical engineers. Students are required to identify a particular area of concentration and are urged to undertake thesis work in that area. Careful planning and detailed advising throughout each student's period of study serve to ensure an integrated educational experience.

Admission Policy

This program is open to applicants holding a bachelor's degree in electrical engineering who have compiled a strong undergraduate record with a "B" average or better. In some instances, students who do not meet the above criteria may be considered for admission on the basis of evaluation of their current status, goals and potential for success in the program. Such students may be required to undertake additional coursework in order to complete the degree requirements. Applicants are urged to submit Graduate Record Examination (GRE) scores to provide additional information for the admissions decision. Two letters of recommendation from individuals familiar with the applicant's potential for graduate study are also required.

A student need not be admitted to the program in order to enroll in an individual course; however, approval should be obtained from the course instructor. Courses completed prior to achieving official admission to the program may be applied to the degree requirements with the approval of the program coordinator.

Transfer Credit

The transfer of graduate credit from other institutions may be permitted with the approval of the program coordinator and subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Thesis/Comprehensive Examination

Students may elect to undertake a thesis project for partial fulfillment (six or nine credits) of the requirements for the degree. The thesis must show ability to organize materials in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific department requirements. Detailed information concerning these requirements is available from the department office.

Students who do not elect to undertake thesis work must pass a comprehensive final examination. This examination may be oral, written or both and will be based on the program of study that the student has completed for the degree. Additional information about the comprehensive examination is available from the academic adviser.

M.S.E.E.

A total of 36 graduate credit hours is required for completion of the degree of master of science in electrical engineering. Candidates for the degree must complete 15 credit hours of required courses and 21 credit hours of electives. Students admitted to the program are assigned to an academic adviser who serves as a mentor to the student, assists in planning the program of study and specifies any additional course-

work that may be needed as preparation for graduate study. A detailed schedule of courses leading to completion of the degree is prepared and approved when the student enters the program. This plan of study must include an emphasis in a major area of the discipline; and, if a thesis is elected, the work must be in this major area. Subsequent changes in the plan of study must be approved by the academic adviser.

Required Courses

Two mathematics courses*

Plus the following:

EE 603/Discrete and Continuous Systems I
EE 604/Discrete and Continuous Systems II
EE 650/Random Signal Analysis
Approved Electives (seven courses)
Total credits 36

**Selection of the required mathematics courses must be made with the approval of the academic adviser. Students may not take M 610, M 615 or M 616 for credit in this degree program.*

Elective Courses

EE 605/Computer Controlled Systems
EE 606/Robot Control
EE 630-1/Electronics Instrumentation I and II
EE 634-5/Digital Signal Processing I and II
EE 637-8/Power Systems Engineering I and II
EE 645/Introduction to Communication Systems
EE 646-7/Digital Communications I and II
EE 652/Design of Digital Filters
EE 658/Microprocessors—Theory and Applications
EE 670/Selected Topics
EE 680/Fiber Optic Communications
EE 681/Lightwave Technology
EE 685/Optimization of Engineering Systems
EE 695/Independent Study
EE 697-9/Thesis I, II and III

With the approval of the academic adviser, two of the elective courses may be taken in other disciplines of mathematics, engineering or physics.

Environmental Engineering

Coordinator: M. Hamdy Bechir, Professor of Civil Engineering, Sc.D., Massachusetts Institute of Technology

The environmental engineering program is intended to meet the needs of engineers for academic work beyond the baccalaureate level. The program may be interdisciplinary in nature and may incorporate both engineering and science courses.

There exists today a need for a substantial number of engineers knowledgeable in environmental areas. Industries that are required to control the pollution of air and water need environmental engineers. Federal, state and local governments must hire employees and consultants to assist them in environmental matters. Other new vistas will undoubtedly open to the environmental engineers in the future. Environmental engineers will be in increasingly greater demand with the increasing problems of pollution.

This program provides the advanced educational skills necessary to meet the ever-increasing need for engineers with an environmental background. It is designed to offer vigorous, professionally oriented engineering and science courses.

The program consists of a required sequence of eight courses which each student must complete. The balance of the program consists of elective courses selected on the basis of the student's principal field of interest. Each student, upon entering this program, will be assigned a faculty adviser who will consult with the student during the program of study and will assist the student in selection of suitable electives. The faculty adviser will also act as the student's research project adviser.

Admission Policy

Candidates for admission in the environmental engineering program are expected to have an engineering B.S. degree from a program accredited by the Accreditation Board for Engineering and Technology.

M.S., Environmental Engineering

A total of 39 credit hours must be completed to earn the master of science in environmental engineering degree. The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Required Courses

CE 601/Water Treatment
CE 602/Wastewater Treatment
CE 605/Solid Waste Management
CE 606/Environmental Law and Legislation
CE 620/Engineering Hydrology
CE 623/Open Channel Hydraulics
CE 627/ Groundwater Hydrology
CE 690/Research Project
Electives (five courses)
Total credits 39

Elective Courses*

CE 607/Water Pollution Control Processes
CE 612/Advanced Wastewater Treatment
CE 613/Industrial Wastewater Control
CE 614/Surface Water Quality Management
CE 616/Groundwater Waste Disposal
CE 621/Advanced Hydrology
CE 624/Computer Applications in Hydrology/Hydraulics
CE 630/Reinforced Concrete Design
CE 631/Structural Steel Design
CE 632/Load and Resistance Factor Design for Structural Steel
CE 633/Wood Engineering
CE 634/Prestressed Concrete Design
CE 640/Structural Analysis
CE 650/Soil Mechanics I
CE 651/Soil Mechanics II
CE 652/Foundation Engineering I
CE 653/Foundation Engineering II
CE 660/Project Planning
CE 670/Selected Topics
CE 678/Computer Applications in Civil Engineering
CE 695-6/Independent Study I and II
CE 698-9/Thesis I and II
CH 601/Environmental Chemistry
EC 608/Economics for Public Administrators
EN 600/Environmental Geoscience
EN 601/Principles of Ecology
EN 602/Environmental Effects of Pollutants

**Other courses may be taken as electives with the approval of the program coordinator.*

Environmental Science

Coordinator: Roman N. Zajac, Assistant Professor of Biology and Environmental Science, Ph.D., University of Connecticut

The purpose of this program is to provide graduate-level education for careers in environmental science as well as for other areas requiring knowledge of environmental principles. It is intended to meet the needs of those who wish to enter this dynamic and expanding field, those who are active environmental scientists and managers, and also those students who plan to pursue graduate training beyond the master's level. An interdisciplinary program comprised of courses in ecology, geology, chemistry and legislation, it provides the advanced skills and knowledge necessary to meet the increasing demand for scientists with an environmental background. Field and laboratory work provide practical experience for students enrolled in the program, while ongoing faculty projects provide opportunities to perform research on various environmental problems and issues.

Scientists knowledgeable in environmental issues and science are needed by employers in these major areas:

- government agencies, particularly in the areas of environmental protection and management;
- water, sewer and power-generation utilities;
- analytic laboratories;
- engineering and environmental firms;
- industries in the field of pollution control;
- private industry and management.

Admission Policy

Candidates for admission to the environmental science program are expected to have a bachelor's degree in one of the natural sciences in which certain prerequisite courses have been completed. Students who lack these undergraduate courses will be required to register for these prerequisite courses at the beginning of the course of study.

M.S., Environmental Science

A total of 39 credit hours must be completed to earn the master of science in environmental science degree. The transfer of credit earned at other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

The program consists of eight required courses and five approved elective courses. Required courses cover common areas in environmental science, while electives enable students to form a plan of concentrated study in a particular area of interest and/or with direct application to their current professional situations. Students may elect to write a thesis as part of the program of study. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements. A thesis is recommended for students who wish to pursue doctoral training after graduation and for those with specific professional interests.

Students should note that some courses have prerequisite requirements. The program coordinator should be consulted for advice in scheduling of required courses and for assistance in selecting approved electives.

Required Courses

CE 606/Environmental Law and Legislation
CH 601/Environmental Chemistry
EN 600*/Environmental Geoscience
EN 601*/Principles of Ecology
EN 602*/Environmental Effects of Pollutants
EN 607*/Environmental Reports and Impact Assessment
EN 615/Toxicology
EN 690*/Research Project
Electives (Approved) (five courses)
Total credits **39**

Elective Courses

CH 602/Environmental Chemical Analysis
EN 603*/Terrestrial and Wetland Ecology
EN 604*/Ecology of Inland Waters
EN 605*/Marine and Estuarine Ecology
EN 606*/Environmental Data Analysis
EN 608/Landscape Ecology
EN 610/Environmental Health
EN 612/Epidemiology
EN 617*/Subsurface Assessment
EN 618/Hazardous Materials Management
EN 670/Selected Topics
EN 695-6/Independent Study I and II
EN 698-9/Thesis I and II

Courses in environmental engineering, chemistry and computer science are also available as electives with the approval of the coordinator. A number of Selected Topics courses in areas such as environmental auditing and bioremediation are also offered during each academic year.

**Some weekend field trips (or acceptable alternatives) are required.*

Executive Master of Business Administration

Director: Ruth Gonchar Brennan, Ph.D., Temple University

The Executive Master of Business Administration program offered by the School of Business is a fully accredited, graduate-level degree program designed for middle- and upper-level managers who have acquired significant managerial experience. The Executive M.B.A. degree is con-

ferred upon completion of a two-year, part-time graduate program organized to meet the education needs of executives within the time constraints and responsibilities imposed by their jobs. Individual participation is emphasized through class discussions, interaction and cooperation with other executives in the class.

Executive M.B.A. classes are offered at the main campus in West Haven and at other locations throughout Connecticut. Each class progresses through the program as a group, thus providing an opportunity for a two-year relationship with other executives for the continuing exchange of ideas and information.

No transfer credit is accepted for admission to the Executive M.B.A. program. Admission to the Executive M.B.A. program is by a special application available from the Director.

Prospective candidates are encouraged to apply as early as possible due to enrollment limitations. The admission procedure includes a screening interview with the Director and review of the applicant's credentials by the Selection Committee. Each candidate is considered on the basis of the special application form, official transcripts from all undergraduate and graduate schools attended, two business-related letters of recommendation and a letter of organizational support.

The Executive M.B.A. program invites both individual and employer-sponsored applications. Information and applications for the Executive M.B.A. program are available from the Office of the Executive M.B.A. Director, Room 200, Echlin Hall, (203) 932-7386.

Executive M.B.A.

The program consists of 20 modules scheduled into two, ten-month academic calendar years. Each module is four sessions in length and has a value of 1.5 credits. All classes meet one afternoon/early evening per week in designated conference facilities for participants' convenience. Participants must agree in advance to attend all classes except for emergencies. Students must be prepared to devote additional time for class preparation and reading assignments.

Modules

First Year
EXID 903/The Communication Process
EXID 960/Information Management
EXID 906/The Management Process
EXID 942/Accounting
EXID 930/Marketing Practice
EXID 915/Quantitative Decision Making
EXID 954/Organizational Development
EXID 918/Managerial Economics
EXID 933/Managing the Global Marketplace
EXID 939/Operations Research and Management

Second Year
EXID 924/Financial Management I
EXID 927/Financial Management II
EXID 945/Human Resources Management
EXID 948/Labor and Management Relations
EXID 909/Business and Government Relations
EXID 951/Marketing Management
EXID 943/Federal Taxation
EXID 957/Corporate Policy and Strategy
EXID 999/Special Research Topics
EXID 921/Executive Leadership Seminar
Total credits 30

Fire Science

Director: Frederick Mercilliott, Professor of Professional Studies; Ph.D., City University of New York; D.A., Western Colorado University

Fire science is an interdisciplinary master's program designed to provide advanced training for fire service, fire safety, occupational safety and security professionals who are involved with fire protection.

Fire protection specialists require knowledge of the science and methodology for preserving lives and property by preventing or minimizing losses resulting from fires, explosions, accidents and other hazards.

Current national needs indicate that trained fire protection specialists are in extremely limited supply. Initial job opportunities in the insurance field, industry and government service may involve applications engineering, research and product design, buildings and systems design, hazard analysis, sales of equipment or insurance sales.

The fire science program and courses cover a wide range of problems including the proper design arrangement and use of building materials; analysis of fire and explosion hazards; safe design of industrial processes; management of industrial loss control and insurance programs; and safe design, selection and handling of equipment and materials. Training is provided in the design of automatic fire extinguishing and detection systems and the application of fire protection principles to fire department, water supply and building code aspects of community planning.

M.S., Fire Science

Candidates are required to complete 39 credit hours of graduate work, which may include an internship in fire science. Transfer credit from other institutions may be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Students in the fire science degree program are required to complete the required core courses, a concentration in either administration or technology and 12 credits of electives. Within the elective portion of the program, students must take either FS 690 Research Seminar and a comprehensive examination, or FS 698 and 699 Thesis I and Thesis II.

Students electing to write a thesis must register for thesis credit with the department. The thesis must show the ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with Graduate School policy on theses as well as specific department requirements.

Required Courses

FS 625/Chemistry of Fires and Explosions
FS 666/Seminar on Industrial Fire Protection
FS 667/Fire and Building Codes, Standards and Practices
FS 668/Fire and Casualty Insurance Practices
FS 669/Dynamics, Evaluation and Prevention of Structural Fires
Concentration (four courses)
Electives (four courses)
Total credits **39**

Concentration in Administration

CS 602/Computing Fundamentals
MG 637/Management
PA 602/Public Policy Formulation and Implementation
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
Total credits **12**

Concentration in Technology

FS 661/Systems Approach to Fire Safety I
FS 662/Systems Approach to Fire Safety II
FS 670/Selected Topics
FS 693/Internship
Total credits **12**

Elective Courses

CJ 649/Fire Scene Investigation and Arson Analysis (4 credits)
CJ 676/Security Management Seminar
CJ 677/Private Security in Modern Society
CO 621/Managerial Communication
FS 664/Terrorism
FS 665/Legal Aspects of Fire and Arson Investigation
FS 684/Fire/Accident Scene Reconstruction
FS 690/Research Seminar
FS 698-9/Thesis I and II
P 619/Organizational Behavior
P 670/Selected Topics
SH 602/Safety Organization and Administration
SH 620/Occupational Safety and Health Law
SO 610/Urban Sociology
SO 620/Sociology of Bureaucracy

In addition, approved courses from the departments of fire science, industrial engineering, management or political science may be taken as electives with the consent of the program director.

See page 86 for the professional certificate in fire science.

Forensic Science

Director: R. E. Gaensslen, Professor of Forensic Science, Ph.D., Cornell University

Forensic science is a broad, interdisciplinary field in which the natural sciences are employed to analyze and evaluate physical evidence in matters of the law. The interdisciplinary forensic science program has these concentrations: criminalistics, fire science and advanced investigation. In addition to the M.S. degree programs, professional certificates are offered in all the specialties for those who require only the specialized courses. The criminalistics program provides the advanced technical background for professional laboratory examiners and those wishing to enter the criminalistics field.

The fire science program provides advanced training in arson scene investigation, laboratory analysis of arson-related evidence and related aspects of arson and fire investigation. The advanced investigation program provides advanced training in the forensic sciences and in investigation techniques, and is designed for students interested in identification, crime-scene, investigative and other field work.

The program and courses stress not only up-to-date analytic and scientific methods, but also a broad understanding of the concepts underlying the forensic sciences. Degree programs in forensic science require a sequence of core courses, followed by concentration requirement courses and a flexible offering of electives designed to meet individual needs.

Admission Policy

For admission to the criminalistics concentration in the M.S. in forensic science program, students must have an undergraduate degree in a natural science field. In addition, applicants are required to take the Graduate Record Examination (GRE) and submit their scores to the Graduate School.

For admission to the fire science or advanced investigation concentrations in the M.S. in forensic science program, students must have a baccalaureate degree from an accredited institution. The degree need not be in natural science, and the GRE is not required.

M.S., Forensic Science

Candidates are required to complete 40 credit hours of graduate work. Transfer of credit from other institutions may be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. *At the time of application to the forensic science master's program, applicants must specify one of the three areas of concentration.*

Thesis

Students may elect to write a thesis in lieu of CJ 690 Research Project/CJ 693 Internship and three credits of elective coursework. Registration for a minimum of six thesis credits (CJ 697, CJ 698) would be required. The thesis must show an ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Required Courses

CJ 614/Survey of Forensic Science
CJ 620/Advanced Criminalistics I
CJ 640/Advanced Criminalistics II
CJ 653/Physical Analysis in Forensic Science
CJ 673/Biomedical Methods in Forensic Science
CJ 690/Research Project, *or* CJ 693/Criminal Justice Internship
Concentration (seven courses, 22 credits)
Total credits 40

Elective Courses

CJ 608/Law and Evidence
CJ 610/Administration of Justice
CJ 670/Selected Topics
CJ 675/Private Security Law
CJ 676/Security Management Seminar
CJ 677/Private Security in Modern Society
CJ 695/Independent Study
SH 602/Safety Organization and Administration
SH 620/Occupational Safety and Health Law
SH 630/Product Safety and Liability

In addition, other concentration courses (in lists from which one, two or more must be taken) may be taken as electives. Courses listed as requirements for one of the concentrations may be taken as electives for other concentrations with the permission of the director of the program.

Concentration in Advanced Investigation

CJ 616/Advanced Crime Scene Investigation
CJ 632/Advanced Investigation I
CJ 633/Advanced Investigation II
Electives (three courses, 10 credits)

Plus one of the following:

CJ 608/Law and Evidence
PS 605/Criminal Law
Total credits **22**

Concentration in Criminalistics

CJ 621/Advanced Criminalistics I Laboratory (1 credit)
CJ 641/Advanced Criminalistics II Laboratory (1 credit)
CJ 654/Physical Analysis in Forensic Science Laboratory (1 credit)
CJ 674/Biomedical Methods in Forensic Science Laboratory (1 credit)
Electives (three courses, 10-12 credits)

Plus two of the following:

CH 621/Chemical Forensic Analysis with Laboratory (4 credits)
CH 631/Advances in Analytic Chemistry
CJ 660/Forensic Microscopy (4 credits)
CJ 661/Medicolegal Investigation and Identification
CJ 662/Forensic Toxicology (4 credits)
CJ 663/Advanced Forensic Serology I (4 credits)
CJ 664/Advanced Forensic Serology II (4 credits)
Total credits **22**

Concentration in Fire Science

CH 625/Chemistry of Fires and Explosions
CJ 649/Fire Scene Investigation and Arson Analysis (4 credits)
CJ 608/Law and Evidence, *or* FS 665/Legal Aspects of Fire and Arson Investigation *or* PS 605/Criminal Law
Electives (three courses, 9 credits)

Plus one of the following:

CJ 667/Fire and Building Codes, Standards, and Practices
CJ 668/Fire and Casualty Insurance Practices
CJ 669/Dynamics, Evaluation and Prevention of Structural Fires
CJ 684/Fire/Accident Scene Reconstruction
Total credits **22**

See pages 86-87 for professional certificates in forensic science.

Hotel and Restaurant Management (M.B.A.)

Concentration Adviser: James F. Downey, Professor of Hotel and Restaurant Management, Ph.D., Purdue University

The hotel and restaurant management program, a concentration in the master of business administration degree, prepares men and women for professional careers in the hospitality industry.

Today's college graduates will find the career paths leading to top management positions in the hotel and restaurant industry to be different from and more difficult than those of the recent past. Considerable hands-on experience together with an M.B.A. will be necessary for those intent on becoming tomorrow's chief hospitality executives and corporate officers.

This program's objectives are to:

- develop analytic skills necessary for the competent and profitable operation of a hospitality facility at the unit or corporate level;
- underscore the importance of those financial, economic, marketing and statistical factors which contribute to the success of a hospitality operation; and
- prepare the M.B.A. candidate for a career in hotel and restaurant education.

Career Opportunities

Careers in hotel and restaurant management offer outstanding personal and financial rewards. Graduates of the M.B.A. program face a variety of career possibilities in the United States and abroad, from managing restaurants and food service operations to managing large hotels, private clubs, resorts and housing complexes.

The M.B.A. graduate may seek a challenging and diversified career in operations, accounting, finance or marketing within a hospitality corporation. The food and beverage industry is another alternative for the M.B.A. graduate aspiring to attain an executive or corporate position. The hotel and restaurant management program does not limit the graduate to hospitality fields; students are prepared to enter any field for which an M.B.A. degree is suitable.

Industry Experience

Because of the unique nature of the hotel and restaurant industry, students may be required to complete a 500-hour practicum, evaluated on a case-by-case basis depending on the student's experience working in this career area.

Concentration Courses

A student is required to complete a total of 48 credit hours, with or without thesis. A master's thesis is recommended but not required. Candidates for the M.B.A./Hotel and Restaurant Management degree electing to write a thesis must register for Thesis I and II in the Hotel and Restaurant Management Department and would substitute these six credits of HR 698-699 for MG 690 and one elective course in the program.

The concentration adviser may approve substitutions based on the student's previous coursework, background in the industry and/or work experience in the industry.

Students with no previous *academic* background in the hotel and restaurant industry are required to take HR 600 Hotel and Restaurant Industry. This non-credit course is an overview of the industry.

In addition to the previously stated M.B.A. required courses (see page 37), the hotel and restaurant management concentration consists of:

HR 605/ Hospitality Corporate Law, *or*
HR 635/Hospitality Industry Capital Budgeting and Managerial Accounting
HR 650/Hospitality Corporate Marketing
HR 655/Development of Hotel and Restaurant Operations
HR 670/Selected Topics, *or*
HR/630 Personnel and Labor Relations in Hotel and Restaurant Management Operations
Total credits 12

Industrial Engineering

Coordinator: Ira H. Kleinfeld, Professor of Industrial Engineering, Eng.Sc.D., Columbia University

This program is intended to meet the needs of professionally employed engineers working in an environment where cost effectiveness, high productivity and effective use of resources is crucial. It has been designed to give the student an advanced level of training beyond the baccalaureate, sufficient to prepare for a leadership role in industry,

insofar as the practice of industrial engineering is concerned.

The program centers on a core sequence required of all students. It contains courses in analysis and design considered to be of common interest to all industrial engineers of advanced professional standing. (See the notes which follow regarding waivers related to these core courses.) Students complete the program by choosing elective courses in operations research, human factors, manufacturing engineering, computer science or others that are particularly suited to their professional interests. Electives should be chosen so as to provide a coherent selection meeting the student's needs. Once the student and the student's adviser have agreed on these electives, they shall become part of the student's program of study. All subsequent changes in electives must be made with the adviser's advance written consent.

Admission Policy

Candidates for admission to the program are expected to hold an undergraduate degree in engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET). In some cases, an applicant with a degree in a related field may be considered for admission. Applicants with degrees in fields other than industrial engineering will be required to take a number of undergraduate courses or otherwise demonstrate proficiency in several areas normally included in an undergraduate industrial engineering program.

Though admission decisions are based primarily on an applicant's undergraduate record, the promise of academic success is the essential factor for admission.

Due to the sequencing of courses in this program, full-time students applying to the master's program in industrial engineering usually will be accepted for the fall term only. Acceptance for full-time study to begin in the winter or spring terms will be made only in rare circumstances on a case-by-case basis.

M.S.I.E.

The program consists of 48 credit hours. The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. Required courses may be waived on the basis of undergraduate courses taken at accredited institutions. All waivers must be approved in writing by the department of industrial engineering and are conditional upon subsequent academic performance. In some cases, the program coordinator may permit substitution of relevant courses in place of the required courses.

Research Project/Thesis Requirement

All students in the program will complete a thesis or an appropriate special project which will partially fulfill the elective requirements for the degree. The special project requirement will usually be satisfied by taking a research project course in a group setting. A designated area of study may be indicated for each such research project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those individuals intending to complete a project. In appropriate cases having special approval, a student may elect to write a thesis or take a research project course (as listed in the catalog) on an individual basis.

Required Courses

CS 606/FORTRAN Programming
IE 601/Introduction to Operations Research/Management Science
IE 607/Probability Theory
IE 609/Descriptive and Inferential Statistics
IE 623/Decision Analysis
IE 624/Quality Analysis
IE 651/Human Engineering I
IE 655/Manufacturing Analysis
IE 681/System Simulation
IE 686/Inventory Analysis
IE 688/Design of Experiments
Approved Electives (five courses)
Total credits **48**

Industrial/Organizational Psychology

Coordinator: Robert D. Dugan, Professor of Psychology, Ph.D., Ohio State University

The field of industrial and organizational psychology is directed toward the solution of a wide variety of human problems in organizational settings. This applied behavioral science and profession serves organizations and their employees in a number of areas, including:

- selection and placement of employees
- human resources management
- application of psychological tests and assessment techniques
- employee performance review
- employee training
- management development
- employee motivation and productivity
- organizational climate
- employee attitude and morale measurement
- organizational change and development
- human resources and personnel policy planning
- job analysis and evaluation
- job design and enrichment
- employee assistance programming
- stress management

The goal of the graduate program in industrial/organizational psychology is to develop expertise in applying the principles and practice of the science of psychology to improve the effectiveness and satisfaction of people at work. The program offers an educational experience that has a built-in flexibility to accommodate students with many different career interests. It also provides students with knowledge of contemporary theory, research and practice in the areas listed above.

Admission Policy

Applicants are expected to possess social and interpersonal characteristics that will support success in organizational settings.

Students who give evidence of a mature interest in the application of psychological principles to organizational problems and who hold an undergraduate degree from an accredited college or university are eligible for admission.

Applicants are expected to take the Graduate Record Examination (GRE) and submit their scores to the Graduate School. Applicants will be asked to complete a questionnaire and submit it directly to the Graduate School.

An undergraduate major in psychology is not specifically required as a basis for consideration. However, all students are expected to have at least an introductory-level understanding of psychological concepts, principles and methods before taking courses in the master of arts in industrial/organizational psychology program. Mastery of the content of an undergraduate statistics course, or equivalent, is prerequisite to two of the eight core courses.

M.A., Industrial/Organizational Psychology

A total of 48 credit hours is required of candidates for the degree of master of arts in industrial/organizational psychology. Candidates for this degree are required to complete 24 credit hours of required courses in the core curriculum. Another 24 credit hours (including concentrations, program options and electives) are chosen after consultation with the program coordinator, or an I/O faculty member, in light of the student's academic and professional goals. Students may not complete more than nine credit hours of electives until they have satisfied the core requirements. Up to nine credit hours of electives may be taken in other departments, such as industrial engineering, economics, management, marketing or public management.

Transfer Credit

The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer of credit detailed elsewhere in this catalog.

Thesis

Students may elect to write a thesis as part of the program of study. The thesis must show ability to organize materials in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Program Options

Students have the opportunity to develop a program that meets their particular needs and interests by choosing from many elective courses and various program options. These options include a thesis, for those students interested in future pursuit of a doctoral degree; an internship, for those students interested in a realistic introduction to an organizational environment; or a practicum, for those students who are already employed.

Option 1 (Thesis) is intended primarily for those students who are interested in continuing their education in doctoral-level programs. This option gives students the research experience necessary to be successful in pursuit of admission to and completion of a Ph.D. program.

Option 2 (Internship/Practicum) allows the student to acquire special skills through coordinating formal coursework with an internship or practicum in an organizational setting. The internship gives the student with limited work experience the opportunity to work in one of several cooperating business, social service, health, educational or governmental organizations. The practicum experience is for the student who is currently employed. The area of study will ordinarily be outside of the student's regular job assignment.

The content of the practicum or internship will be established jointly by the cooperating organization, the faculty adviser and the student. A comprehensive project report is required in which the student will analyze and integrate internship/practicum experiences with relevant research and coursework, emphasizing the content of the eight core courses.

Option 3 (Approved Electives) consists of elective courses selected under faculty advisement. The choice of electives is intended to provide the student with a broad interdisciplinary background, complementing the student's own academic training and interest. A comprehensive examination covering material from the required core psychology courses is required under this option.

Program Concentrations

Within each of the program options described above, it is possible for students to concentrate in either the industrial-personnel area or the organizational area of I/O psychology. A concentration requires 12 credit hours of specific elective courses, which would be counted as part of the 24 credits required in the elective option (Thesis, Internship/Practicum or Approved Electives) selected by the student for completion of the program. If a concentration is selected, the student must notify the program coordinator as well as the Graduate Records Office. A concentration is not required if the student's educational or career goals can best be met without this specialization.

Required Courses

EC 625/Industrial Relations
P 608/Psychometrics and Statistics*
P 609/Research Methods*
P 619/Organizational Behavior
P 620/Industrial Psychology
P 635/Assessment of Human Performance with Standardized Tests
P 640/Industrial Motivation and Morale
P 645/Seminar in Industrial/Organizational Psychology
Program option** (eight courses)
Total credits 48

Program Options

Option 1 (Thesis)
P 698-9/Thesis I and II
Electives** (six courses)

Option 2 (Internship/Practicum)
P 693-4/Organizational Internship I and II, *or*
P 678-9/Practicum I and II
Electives** (six courses)

Option 3 (Approved Electives)
Comprehensive examination required
Electives** (eight courses)

**Undergraduate preparation in statistics is prerequisite.*
***The choice of electives is made in consultation with a departmental adviser in light of the student's academic and professional goals.*

Concentration in Industrial-Personnel Psychology

Students who select this concentration will count these course credits toward the elective courses required in one of the program options listed above.

P 610/Program Evaluation
P 644/Performance Measurement

Plus two of the following:

MG 645/Management of Human Resources
P 628/The Interview
P 641/Personnel Development and Training
Total credits 12

Concentration in Organizational Psychology

Students who select this concentration will count these course credits toward the elective courses required in one of the program options listed previously.

P 642/Organizational Change and Development
P 643/The Psychology of Conflict Management

Plus two of the following:

P 612/Consultation Seminar
P 623/Psychology of the Small Group
P 624/Experiential Self-Analytic Group
P 638/Psychology of Communication and Opinion Change
Total credits 12

See page 79 for the senior professional certificate in applications of psychology.

Industrial Relations

Coordinator: Wilfred Harricharan, Professor of Management, Ph.D., Cornell University

Environmental forces over the past decades have created a demand for greater sophistication and professionalism from those responsible for personnel functions within all organizations whether public or private, profit or nonprofit, unionized or not. More and more companies and institutions are requiring the services of people conversant with both the large body of available tools and the constraints that have evolved during this period. The program leading to the master of science degree in industrial relations represents a flexible response to this demand.

Industrial relations, as a management and behavioral science discipline, is concerned with all aspects of the employment relationship and, in particular, with the organization's maintenance of the human resources necessary to achieve organizational objectives. As an academic discipline and profession, industrial relations is an interdisciplinary, problem-solving field that attempts to maintain harmony and resolve conflicts among the four major parties to the employment relationship—employees, employers, government and, where applicable, unions.

The M.S. in industrial relations program is aimed at people presently employed in or aspiring to positions in various kinds of organizations in the fields of employment, training and development, wage and salary administration, employee services and benefits, labor-management relations, job and organizational design, labor economics and manpower planning.

Because of the diversity of student interests and employment demand, the program is flexible. The required courses in the program are drawn from the disciplines of economics, management and psychology. There is a great deal of flexibility in choice of elec-

tive courses. As a result, students will find it possible to tailor the curriculum to their specific needs and interests.

Admission Policy

Candidates for admission are required to hold a baccalaureate degree from an accredited institution of higher education. While not an absolute necessity, the undergraduate degree should preferably be in business administration, public administration or in a social or behavioral science (e.g., economics, history, political science, psychology or sociology). Application for admission is also open to full-time employed professionals in personnel and industrial relations holding a baccalaureate degree in any field from an accredited institution.

Though admissions decisions are usually based on an applicant's undergraduate record, in some cases the applicant may be required to submit scores from the Graduate Management Admission Test (GMAT).

M.S., Industrial Relations

A total of 39 graduate credit hours is required for completion of the master of science degree in industrial relations. Of these, 12 credit hours are in approved elective courses. A list of approved elective courses appears below.

Students may elect to write a thesis in lieu of MG 690 Research Project and one elective course. The thesis must show ability to organize material in a clear and original manner and must present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as all specific department requirements.

Required Courses

EC 625/Industrial Relations
EC 627/Economics of Labor Relations
EC 687/Collective Bargaining
MG 637/Management
MG 645/Management of Human Resources
MG 678/Personnel Management Seminar
MG 679/Industrial Relations Seminar
MG 690/Research Project
P 619/Organizational Behavior
Approved Electives (four courses)
Total credits **39**

Elective Courses

(Other courses may qualify subject to approval of the coordinator.)

A 609/State and Local Taxation
CO 621/Managerial Communication
EC 629/Public Policies Toward Business
HR 630/Personnel and Labor Relations in Hotel and Restaurant Operations
IE 604/Management Systems
MG 640/Management of Health Care Organizations (in lieu of MG 637)
MG 661/Development of Management Thought
MG 662/Organization Theory
MG 663/Leadership in Organizations
MG 664/Organizational Effectiveness
MG 665/Compensation Administration
MG 680/Current Topics in Business Administration
P 620/Industrial Psychology
P 628/The Interview
P 635/Assessment of Human Performance with Standardized Tests
P 640/Industrial Motivation and Morale
P 641/Personnel Development and Training
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 650/Administrative Law
QA 604/Probability and Statistics
SH 608/Industrial Hygiene Practices
SO 601/Minority Group Relations

Management Systems (Sc.D.)

Director: Rolf K. Tedefalk, Professor of Finance, Ph.D., University of Minnesota

The doctor of science in management systems is a terminal, applied research-oriented degree in the broad and rapidly evolving subfield of management systems. It is designed for two audiences: private and public sector employees in senior staff, man-

agement and executive positions; and individuals planning academic careers in management. Students may be accepted for both part-time and full-time study.

The Sc.D. program is accredited by the Board of Governors for Higher Education of the State of Connecticut and by the New England Association of Schools and Colleges.

Admission Policy

All decisions on admission to the UNH doctor of science program are made on an individual basis by a Doctoral Admissions Committee. All applicants must:

- submit the special doctoral program application for admission form along with a written Statement of Purpose document;
- provide official transcripts showing evidence of an earned baccalaureate degree and work to date or completion of an earned master's degree from an accredited institution;
- take the GMAT and/or have official, current or recent (within five years) test scores for the GMAT reported to the university; and
- submit three letters of recommendation for the Sc.D. program.

Application to the doctoral program requires special forms which are available from the Graduate School Admissions Office.

Applicants providing evidence of an earned M.B.A. from an accredited college or university with superior performance in the master's program will be considered for admission when they have met the above requirements for all applicants.

Applicants providing evidence of superior performance in an earned master's degree other than an M.B.A. from an accredited college or university will be required to pass written master's level qualifying examinations in accounting, economics, finance, management, marketing, management information systems and statistics or will be required to complete the appropriate graduate-level course(s) with a grade of "B" or better prior to fully matriculated enrollment in the doctoral-level courses, provided that they have met all other admission criteria. All prerequisites must be completed before enrollment in doctoral- level courses. The Doctoral Admissions Committee and/or faculty teaching doctoral-level courses may require successful completion of special examinations designed to assess current competencies in specific areas.

To provide for the special needs of working people, the UNH doctoral program offers the opportunity for part-time as well as full-time study. Full-time doctoral study at UNH consists of registration for a minimum of four and a maximum of six doctoral courses per academic year of three trimesters. Full-time doctoral study for international students who are required to maintain full-time enrollment for their immigration status is defined as two doctoral courses per trimester for a total of six doctoral courses per academic year. Such persons will continue to be considered full-time students as long as their dissertation adviser, department chair and/or director of the doctoral program certify that the student is making satisfactory progress toward completion of the doctoral degree. Full-time students are expected to spend three years in the program.

Part-time doctoral study will consist of registration for at least two doctoral courses per academic year. Part-time students normally require five to six years to complete the program.

Sc.D., Management Systems

The three segments of the doctoral program are: ten 700-level core courses, written and oral comprehensive examinations, and the completion and successful defense of a dissertation representing the results of original research performed under the supervision of a faculty adviser and a dissertation committee.

Core Program

The core courses, identified by 700-level prefixes, are restricted to doctoral students. The uniform core is required of all students in the program and leads to the doctoral

comprehensive examinations which will qualify the student for candidacy. All core courses must be taken in residence at the university. Course descriptions for the core courses are on pages 137-138 of this catalog.

EC 703/Forecasting and Econometrics
EC 704/Public and Private Policy Interfaces
FI 701/Seminar in Financial Policy
IE 704/Seminar in Management and Control Systems
MG 701/Research Design I
MG 702/Research Design II
MG 737/Seminar in Management
MG 738/Policy and Strategic Decision Making
MK 701/Seminar in Strategic Marketing
P 719/Seminar in Human Resources
Total core credits **30**

Doctoral students are expected to complete the doctoral core courses according to a sequencing approved by the Doctoral Committee. Exceptions to this policy must be approved by the director of the doctoral program. (The annual sequencing of courses may be changed within a given year:)

Suggested Part-Time Sequence

Year 1	MG 701	MG 702	EC 703
Year 2	IE 704	FI 701	MK 701
Year 3	P 719	MG 737	MG 738
Year 4	EC 704		

Suggested Full-Time Sequence

Year 1	MG 701	MG 702	EC 703
	IE 704	FI 701	MK 701
Year 2	P 719	MG 737	MG 738
	EC 704		

Throughout the program, any student with a QPR of less than 3.00 will be placed on probation. A student with a QPR of less than 3.00 upon completion of four or more courses is subject to dismissal from the program. Repetition of doctoral coursework is limited to no more than one repetition of any one course, up to a maximum of two courses.

Comprehensive Examinations

The written comprehensive examinations consist of three parts:

Statistics and Research Methodology: Four-hour examination; content defined by knowledge domains covered in MG 701, MG 702 and EC 703.

Foundation Knowledge: Three-hour examination; content defined by knowledge domains covered in IE 704, FI 701, and MK 701.

Management Systems: Five-hour examination; content defined by knowledge domains covered in P 719, MG 737, MG 738 and EC 704.

Students may sit for the Statistics and Research Methodology examination upon successful completion of MG 701, MG 702 and EC 703 and may sit for the Foundation Knowledge examination upon successful completion of IE 704, FI 701 and MK 701. In order to qualify for admission to the Management Systems comprehensive examination, doctoral students must have completed all of the doctoral core courses with a QPR of at least 3.30.

The doctoral comprehensive examinations will consist of both a written and an oral component. A three-hour oral examination will be scheduled after successful completion of all written examinations. Doctoral students must maintain continuing registration during each trimester.

Dissertation

A dissertation is required of all candidates for the Sc.D. degree. After passing the comprehensive examinations, a candidate will participate in the selection of a dissertation advisory committee. This dissertation committee will be composed of three University of New Haven full-time faculty members and may include at most two persons from outside the university who will act as dissertation readers. The outside persons shall hold earned doctorates and shall

have expertise in the area of the dissertation focus. Doctoral dissertations must be based on original research. Candidates are encouraged to select dissertation topics that are oriented toward applied management problems. The dissertation will contain the research problem and background, the research methods and approaches used, and the results and discussion of the results. The exact definition of the research problems and the research methods will be formulated by the candidate in consultation with the dissertation adviser and with the approval of the dissertation committee.

Candidates must register for a three-credit dissertation course (MG 801, MG 802, MG 803 and MG 804) in each of the four consecutive trimesters following the formal creation of a dissertation committee. After completion of the last of the 10 doctoral core courses, students must maintain continuing registration in each trimester that they are not registered for dissertation credits.

Following successful completion of the doctoral written and oral examinations, students will be notified in writing of their elevation to candidacy for the doctoral degree. Students will then be required to file the appropriate forms approving the members of the student's dissertation committee and the student's dissertation proposal. These forms are available from the director of the doctoral program or from the Graduate School.

All coursework for the Sc.D. program must be completed within five years of completion of the first 700-level course. The dissertation must be completed and successfully defended within eight years of completion of the first 700-level course.

Additional information regarding the requirements for the Sc.D. program in management systems is available from the Graduate School or from the director of the doctoral program.

Mechanical Engineering

Coordinator: Konstantine C. Lambrakis, Professor of Mechanical Engineering, Ph.D., Rensselaer Polytechnic Institute

This program is intended to meet the needs of professionally employed engineers and scientists for academic work beyond the baccalaureate level. Its purpose is to increase competence in modern analysis and synthesis techniques as they apply to engineering design.

The program centers on a core sequence which all students are expected to take. The core courses contain advanced methods of analysis and design which are of common interest in engineering work. Students complete the program by electing a series of courses in mechanical engineering particularly suited to their current professional interests. Early in the program, students, with the approval of the adviser, prepare a detailed plan ensuring an overall educational experience that is integrated and logical.

All decisions regarding both core and elective requirements are subject to final approval by the student's adviser.

Admission Policy

Candidates for admission to the master's program in mechanical engineering are normally expected to have a grade average of "B" or better in their undergraduate coursework and to hold a bachelor's degree in mechanical engineering from a program accredited by the Accreditation Board for Engineering and Technology. In some cases, applicants with a bachelor's degree in a field closely related to mechanical engineering may be considered for admission. Scores from the Graduate Record Examination (GRE), though not required, may be submitted in support of an application for admission. Two letters of recommendation from individuals familiar with the applicant's potential for graduate study are also required. Students accepted on a provisional basis may be required to complete certain

additional undergraduate mechanical engineering courses prior to enrolling in the graduate courses in the program.

M.S.M.E.

A minimum of 36 credits must be completed to earn the master of science degree in mechanical engineering. Transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit. A thesis is optional but highly recommended for students wishing to study in depth particular areas of interest under the guidance of a faculty member. Thesis topics should be approved by the faculty adviser when the student has completed 18-21 graduate credits. Students should contact the coordinator for thesis advisers in these specialized areas: acoustics/aerodynamics, fluids/biomechanics, gas dynamics, heat transfer/thermodynamics, applied mechanics/optics, systems analysis/machine design, materials/metallurgy, random vibrations/numerical analysis, solid mechanics/computer-aided design. Thesis preparation and submission must comply with the Graduate School policy on theses as well as with all specific department requirements.

If a thesis is not chosen, and unless a major special project approved by the graduate program coordinator is completed within the scope of other mechanical engineering courses, a student will be required to undertake a three- or six-credit project, on an independent study basis, supervised by a full-time faculty member in the department of mechanical engineering.

Required Courses

ME 602/Mechanical Engineering Analysis
ME 604/Numerical Techniques in Mechanical Engineering
ME 610/Advanced Dynamics
ME 615/Theory of Elasticity
ME 620/Classical Thermodynamics
ME 630/Advanced Fluid Mechanics
Electives (six courses)
Total credits 36

Elective Courses*

M 624/Applied Mathematics
ME 605/Finite Element Methods in Engineering
ME 611/System Vibrations
ME 612/Random Vibrations
ME 613/Fundamentals of Acoustics
ME 625/Mechanics of Continua
ME 632/Advanced Heat Transfer
ME 635/Dynamic Systems and Control
ME 638/Measurement and Instrumentation in Mechanical Engineering
ME 645/Computational Fluid Dynamics and Heat Transfer
ME 670/Selected Topics
ME 695-6/Independent Study I and II
ME 698-9/Thesis I and II

**With the coordinator's approval, two of the elective courses may be taken in departments other than mechanical engineering.*

Occupational Safety and Health Management

Coordinator: Brad T. Garber, Professor of Occupational Safety and Health, Ph.D., University of California, Berkeley

The M.S. program is designed to develop the skills required to manage a comprehensive safety and health program. It will accommodate both active practitioners and persons who wish to enter this dynamic field. An in-depth education is provided through a program of 30 credit hours of required courses and 18 credit hours of electives. The courses provide training in both the technical and management areas.

Specifically, the graduates of the program will have received extensive instruction in how to:

- evaluate the quality and effectiveness of existing safety programs;
- conduct surveys for health and safety hazards;
- institute programs to improve safety and

health performance;
- establish accident prevention procedures;
- implement control measures to eliminate or reduce hazards;
- recommend methods of compliance with local, state and federal regulations and with voluntary standards, and
- manage occupational safety and health programs in industry, government and labor unions.

Admission Policy

Candidates for admission to the master of science in occupational safety and health management program are required to hold a baccalaureate degree from an accredited institution. Undergraduate courses in general chemistry, general physics and biology are required. Students who do not meet all requirements will be evaluated on an individual basis.

M.S., Occupational Safety and Health Management

Candidates are required to complete 48 credit hours of graduate work. Transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit noted elsewhere in this catalog. Consideration for waiver of core courses on the basis of undergraduate experience is at the discretion of the program coordinator.

The student will choose 12 credit hours of electives in consultation with the adviser. Students also must take six credit hours of SH 693/694 Internship, SH 690/691 Research Project, or SH 698/699 Thesis.

Students electing to write a thesis must register for thesis credit with the department. The thesis must show the ability to organize material in a clear and original manner and present well-reasoned conclusions. Thesis preparation and submission must comply with the Graduate School policy on theses as well as specific department requirements.

Required Courses

IE 651/Human Engineering I
MG 637/Management
P 619/Organizational Behavior
QA 604/Probability and Statistics
SH 602/Safety Organization and Administration
SH 605/Industrial Safety Engineering
SH 608/Industrial Hygiene Practices
SH 615/Toxicology
SH 620/Occupational Safety and Health Law
SH 630/Product Safety and Liability
Electives (six courses)
Total credits **48**

Elective Courses*

CE 602/Wastewater Treatment
CE 607/Water Pollution Control Processes
CH 601/Environmental Chemistry
EN 602/Environmental Effects of Pollutants
EN 610/Environmental Health
EN 612/Epidemiology
FS 666/Seminar on Industrial Fire Protection
IE 612/Managerial Interactions I
MG 664/Organizational Effectiveness
MG 678/Personnel Management Seminar
P 640/Industrial Motivation and Morale
SH 611/OSH Research Methods and Techniques
SH 660/Industrial Ventilation
SH 661/Microcomputers in Occupational Safety and Health
SH 665/Occupational Safety and Health Measurements
SH 670/Selected Topics
SH 690-1/Research Project I and II
SH 693-4/OSH Internship I and II
SH 695-6/Independent Study I and II
SH 698-9/Thesis I and II

**Other courses may be substituted with the consent of the program coordinator.*

Concentration in Industrial Hygiene

Within the master of science program in occupational safety and health management, students may use their electives to fulfill the requirements for a concentration in industrial hygiene. The coursework is designed to meet the needs of both practicing industrial hygienists and those aspiring to enter this profession. Development of skills in the recognition, evaluation and control of occupational health hazards is the focus of this concentration.

Students pursuing this concentration will take the required core curriculum, the six required credits of internship, research project or thesis and the following elective courses:

EN 610/Environmental Health
EN 612/Epidemiology
SH 660/Industrial Ventilation
SH 665/Occupational Safety and Health Measurements
Total credits 12

Operations Research

Coordinator: Ira H. Kleinfeld, Professor of Industrial Engineering, Eng.Sc.D., Columbia University

Operations research has become an important professional discipline in recent years. Complex technical problems have been examined and solved using advanced mathematical techniques and computers. The master of science in operations research curriculum provides thorough coverage of the theory, methodology and application of these techniques. The program is designed to prepare qualified applicants with solid mathematics training—but from otherwise diverse backgrounds—to deal with important industrial, business, commercial and governmental problems.

The program centers on a sequence of core courses recognized to be of common interest to all operations research practitioners of advanced professional standing. Students complete the program by choosing elective courses in operations research, computer science, mathematics or other courses that are particularly suited to their professional interests. Electives should be chosen so as to provide a coherent selection meeting the student's needs. Once the student and an adviser have agreed to these electives, they shall become a part of the student's program of study. All subsequent changes in electives must be made with the adviser's advance written consent.

M.S., Operations Research

The program consists of 45 credit hours. Students entering this program are expected to be competent in mathematics through calculus. Those with insufficient mathematics background would be required to take approved mathematics course(s) outside the program requirements. The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog. Required courses may be waived on the basis of undergraduate courses taken at accredited institutions. All waivers must be approved in writing by the program coordinator and are contingent upon subsequent academic performance. In some cases, the coordinator may permit substitution of relevant courses in place of required courses.

Research Project/Thesis Requirement

All students in the program will complete a thesis or an appropriate special project which will partially fulfill the elective requirements for the degree. The special project requirement will usually be satisfied by taking a research project course in a group setting. A designated area of study may be indicated for each such research project course; in these cases, the instructor will offer direction in the area and will assist students in the development of substantial individual projects. Particular requirements or prerequisites may be set for the course or for those individuals intending to complete a project. In appropriate cases having special approval, a student may elect to write a thesis or take a research project course (as listed in the catalog) on an individual basis.

Required Courses

CS 606/FORTRAN Programming
IE 601/Introduction to Operations Research/Management Science
IE 607/Probability Theory
IE 609/Descriptive and Inferential Statistics
IE 621/Linear Programming
IE 622/Queueing Theory
IE 625/Advanced Mathematical Programming
IE 681/System Simulation
IE 685/Theory of Optimization
IE 687/Stochastic Processes
IE 688/Design of Experiments
Approved Electives (four courses)
Total credits 45

Public Administration

Coordinator: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

The general purpose of the master of public administration degree is the training of men and women at the graduate level for public service careers. Specifically, the program strives to:

- equip students with modern analytic and quantitative tools of decision making and their application to complex problems of government and nonprofit organizations;
- expose students to the wide range of administrative and managerial problems and responsibilities in the public sector; and
- increase the student's knowledge and skills in the particular management functions of budgeting, planning, public policy formulation, public finance, public personnel administration and collective bargaining.

M.P.A.

The program consists of 42 graduate credit hours which are required of candidates for this degree.

Students entering the M.P.A. program who lack adequate preparation in quantitative techniques may be required to enroll in a non-credit course, QA 600 Quantitative Analysis, in order to satisfy a prerequisite requirement. Adequate preparation is defined as satisfactory completion of six credit hours of quantitative techniques and/or mathematics with a grade of "C" or better in such coursework.

Required Courses

EC 608/Economics for Public Administrators
PA 601/Principles of Public Administration
PA 602/Public Policy Formulation and Implementation
PA 604/Communities and Social Change
PA 611/Research Methods in Public Administration
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 625/Administrative Behavior
PA 632/Public Finance and Budgeting
PA 690/Research Seminar
Electives or Concentration (five courses)
Total credits 42

Concentration in City Management

The courses selected for this concentration will enable local government practitioners to develop and make better use of their personnel and budgetary resources. This ability is especially important today, as the federal government is reducing its fiscal support to local governments.

Students choosing the concentration in city management will take the required core curriculum of nine courses and follow the city management concentration in lieu of their five elective courses.

PA 630/Fiscal Management for Local Government
PA 660/Urban Planning: Theory and Practice
PA 661/Problems of Metropolitan Areas
PS 616/Urban Government

Plus one of the following:

EC 665/Urban and Regional Economic Development
P 610/Program Evaluation
SO 610/Urban Sociology
Total credits 15

Concentration in Health Care Management

This concentration is designed for those individuals currently in health care management or those who anticipate a career in health care management. Courses provide students with the conceptual and practical skills necessary for the management of a health care organization.

Students choosing the health care concentration will take the core curriculum of nine courses and follow the health care concentration in lieu of their five elective courses.

MG 640/Management of Health Care Organizations
PA 641/Financial Management of Health Care Organizations
PA 643/Health and Institutional Planning
PS 635/Law and Public Health

Plus one of the following:

PA 642/Health Care Delivery Systems
PA 644/Administration of Programs and Services for the Aged
PA 645/Health Care Economics and Finance
PA 646/Organization and Management of Long-Term Care Facilities
PA 647/Alternative Health Care Delivery Systems
PA 648/Contemporary Issues in Health Care
PA 670/Selected Topics
Total credits 15

Concentration in Long-Term Health Care

This program is approved by the Department of Health Services, State of Connecticut, as a course of study in long-term health care. Students who complete these concentration courses are eligible to take the state licensing examination for long-term care administration, preparing individuals for participation in this area of expanding opportunities for health care practitioners.

In the following sequence, PA 646 must be taken before or concurrently with PA 681; PA 682 must be taken after PA 681 and PA 646. No waivers, substitutions or transfer credits will be permitted in this concentration.

Students choosing the long-term health care concentration will take the core curriculum of nine courses and the four courses in the concentration plus one additional elective course.

PA 641/Financial Management of Health Care Organizations
PA 646/Organization and Management of Long-Term Care Facilities
PA 681/Long-Term Health Care Internship I
PA 682/Long-Term Health Care Internship II
Total Credits 12

Concentration in Personnel and Labor Relations

The concentration in personnel and labor relations is designed to meet the need for better trained personnel and labor relations specialists in the public sector. The public sector has experienced a growth in union membership, but has not had a corresponding growth in the capability to deal with public sector/union relationships. In addition, the courses in this concentration will provide training for public administrators in areas such as employee motivation, organizational change and group dynamics.

Students choosing this concentration will take the required core curriculum of nine courses and follow the personnel and labor relations concentration in lieu of their five elective courses.

MG 645/Management of Human Resources, *or* SH 602/Safety Organization and Administration

*Plus two of the following:**

EC 625/Industrial Relations
EC 627/Economics of Labor Relations
EC 687/Collective Bargaining

*Plus two of the following:***

CO 621/Managerial Communication
MG 664/Organizational Effectiveness
P 620/Industrial Psychology
P 628/The Interview
P 632/Group Dynamics and Group Treatment
P 640/Industrial Motivation and Morale
P 642/Organizational Change and Development
P 651/Organizational Behavior Modification
Total Credits 15

**Prerequisite for this group: EC 608 Economics for Public Administrators, or permission of the M.P.A. coordinator.*
***Prerequisite for this group: PA 625 Administrative Behavior, or permission of the M.P.A. coordinator.*

Taxation

Coordinator: Robert E. Wnek, Associate Professor of Tax Law, Accounting and Business Law, LL.M., Boston University School of Law, C.P.A.

The decision by government to utilize its taxing authority to pursue a variety of economic and social goals has led to the development of a complex body of tax law. Given the dynamic state of society's economic and social goals, the body of tax law characteristically exists in a continual state of change.

The complexity of tax law is significant because of its influence on the economic decision-making process and because of its impact on the successful achievement of society's goals. Tax consequences have been and will continue to be an important financial consideration.

Program Objectives

In recognition of the above, a need to prepare technically competent individuals for careers in the field of taxation has developed. Owing to the complex and dynamic nature of tax law, it appears appropriate to conduct this preparation at an advanced level of inquiry with an emphasis upon examining the issues of current interest in taxation. Accordingly, the master of science program in taxation has been designed as a framework to accomplish the following objectives:

- to prepare students for technical competence in understanding and interpreting tax law;
- to familiarize students with the administrative structure and procedures of the Internal Revenue Service;
- to inform students about approaches to independent research in the field of tax law; and
- to offer an understanding of the role tax law plays in social and economic policy.

Given the above objectives, the master of science program in taxation provides a framework through which advanced and timely tax training can be acquired by experienced professionals (accountants and attorneys) practicing in the field of taxation, as well as individuals seeking to prepare themselves for entry into career positions in taxation.

Admission Policy

Admission to the program is available to C.P.A.s, attorneys and persons holding an undergraduate degree from an accredited institution, preferably, but not exclusively, in accounting or in business administration with a major in accounting. Persons holding other than the above degrees will be required to take a number of selected undergraduate courses as a condition of admission. Admission is based primarily on an applicant's undergraduate record; however, the promise of academic success is the essential factor for admission. In support of applications, applicants may submit their scores from the Graduate Management Admission Test (GMAT). An applicant may be required to take this test.

M.S., Taxation

A total of 36 credit hours, including a research project, is required for the master of science in taxation degree. Students must fulfill the requirements of *either* the corporate taxation specialization *or* public taxation specialization. The transfer of credit from other institutions will be permitted subject to the Graduate School policy on transfer credit detailed elsewhere in this catalog.

Corporate Taxation Specialization

A 601/Individual Income Taxation
A 602/Sales and Exchanges of Property
A 604/Corporate Income Taxation I
A 605/Corporate Income Taxation II
A 607/Tax Accounting
A 610/Consolidated Returns
A 612/International Taxation
A 614/Federal Tax Practice and Procedure
A 615/Research Project in Federal Income Taxation

Plus three of the following:

A 603/Qualified Retirement Plans
A 608/Estate and Gift Taxation
A 609/State and Local Taxation
A 611/Income Taxation of Estates and Trusts
A 613/Taxation of Partnerships and Partners
A 617/Estate Planning
A 670/Selected Topics(Approved)
Total credits **36**

Public Taxation Specialization

A 601/Individual Income Taxation
A 602/Sales and Exchanges of Property
A 603/Qualified Retirement Plans
A 604/Corporate Income Taxation I
A 605/Corporate Income Taxation II
A 607/Tax Accounting
A 608/Estate and Gift Taxation
A 614/Federal Tax Practice and Procedure
A 615/Research Project in Federal Income Taxation

Plus three of the following:

A 609/State and Local Taxation
A 610/Consolidated Returns
A 611/Income Taxation of Estates and Trusts
A 612/International Taxation
A 613/Taxation of Partnerships and Partners
A 617/Estate Planning
A 670/Selected Topics (Approved)
Total credits **36**

For practitioners wishing to improve or update their tax skills but uncertain about pursuing a master's in taxation, two senior professional certificates are offered: Taxation of Individuals (Option I) and Taxation of Corporations (Option II), as described on page 83.

Practicing C.P.A.s in need of continuing education credits and others seeking to expand their tax backgrounds should consider these alternatives.

Tourism and Travel Administration (M.B.A.)

Concentration Adviser: Elisabeth van Dyke, Associate Professor of Tourism and Travel Administration, Ph.D., Columbia University

The tourism and travel administration program, a concentration in the master of business administration degree, prepares men and women for professional careers in the travel industry.

Forecasters have predicted that in the 1990s tourism and its related industries will be the leading economic factor not only in the United States, but in most nations throughout the world.

Academic training for tourism industry careers has increased at an unprecedented rate during the last decade. More than 50 two-year college programs are in place. On the four-year level, the University of New Haven is one of only a few universities in the country offering a complete bachelor's degree in the field. The M.B.A. concentration

in tourism and travel is the first program of its kind in the nation.

This program's objectives are to:

- offer an in-depth knowledge of the travel and tourism industry;
- underscore the interrelationship of the travel and tourism industry with national and international endeavors of business, government and multinational organizations; and
- develop the analytic skills necessary for managerial responsibility in all facets of the tourism industry.

Career Opportunities

As the travel and tourism industry continues its expansion, an outstanding variety of careers become available in all phases of the industry. Graduates of the M.B.A. program can pursue managerial careers in the United States as well as overseas. Challenging careers exist with international corporations and government agencies in the fields of aviation and tourism promotion. International tourism organizations, many of which are now affiliated with the United Nations, seek trained managers to staff overseas headquarters.

State, regional and city tourism offices, travel wholesalers, tour operators and travel conglomerates have turned to the academic world for qualified personnel. As college and university programs in tourism increase, a teaching career also becomes a viable alternative.

Industry Experience

Because of the unique nature of the tourism and travel industry, students may be required to complete a 500-hour practicum, evaluated on a case-by-case basis depending on the student's experience working in this career area.

Concentration Courses

A student is required to complete a total of 48 credit hours, with or without thesis. A master's thesis is recommended but not required. Candidates for the M.B.A./Tourism and Travel Administration degree electing to write a thesis must register for Thesis I and II in the Tourism and Travel Department and would substitute these six credits of TT 698-699 for MG 690 and one elective course in the program.

The concentration adviser may approve substitutions based on the student's previous coursework, background in the industry and/or work experience in the industry.

Students with no previous *academic* background in the tourism and travel industry are required to take TT 600 The Tourism Industry. This non-credit course is an overview of the industry.

In addition to the previously stated M.B.A. required courses (see page 37), the tourism and travel administration concentration consists of:

Any four of the following:

TT 610/Legal Aspects of the Travel Industry
TT 620/Deregulation: A New Era in the Travel Industry
TT 625/Travel Industry Human Resources Development *or* MG 645/Management of Human Resources
TT 630/International Tourism and Travel
TT 635/Corporate Travel
TT 660/Comparative Tourism
TT 670/Selected Topics
Total credits **12**

Senior Professional Certificates

These certificates are limited to those already holding an advanced degree who want additional graduate study in a coherent course of study.

Inasmuch as the senior professional certificate is not a degree, a student may transfer credits earned toward a certificate into a master's program at any time, subject to the requirements of the master's degree and the decision of the coordinator of the master's program, and to acceptance in the master's program. Professional certificates, for those without advanced degrees, are available in arson investigation, civil engineering design,

criminal justice, fire science, forensic science, health care management, human resources management, industrial hygiene, international relations, legal studies, logistics, long-term health care, mental retardation services, occupational safety, and public administration.

A student who completes the work required for a certificate does not attend commencement. A petition for certification must be filed with the Graduate Registrar and the appropriate fee paid. When the coursework is reviewed and found complete, the certificate will be mailed to the student. A minimum QPR of 3.00 is required in courses taken at the university as part of the senior professional certificates.

Senior Professional Certificate Requirements

Study consists of 12 to 18 credits, depending upon the area chosen. Students, having chosen the area of study, should contact the adviser who is listed for that particular area. Students must meet all course prerequisite requirements.

Course waivers are not permitted for senior professional certificates; course substitutions may be granted by the adviser.

Courses of Study

A broad range of senior professional certificates is offered. They are as follows:

Accounting
  I: Financial Accounting
  II: Managerial Accounting
  III: Accounting Information Systems
Applications of Psychology
Computer and Information Science
Finance
General Management
Health Care Management
Hotel and Restaurant Management
Human Resources Management
International Business
Marketing
  I: Marketing
  II: Quantitative Techniques in Marketing
Occupational Safety and Health Management
Public Management
  I: Survey of the Field
  II: Public Personnel Management
Public Safety Management
Taxation
  I: Taxation of Individuals
  II: Taxation of Corporations
Telecommunication Management

Accounting

Adviser: Robert G. McDonald, Associate Professor of Accounting, M.B.A., New York University; C.M.A., C.I.A., C.F.A., C.P.A.

The certificates in accounting are recommended to students and professionals whose education already includes an accounting degree and who wish to pursue accounting at an advanced level without necessarily enrolling in the full graduate program. They are especially recommended to certified public accountants who wish to obtain continuing professional education credits in an academic environment.

Option I: Financial Accounting

A 650/Advanced Accounting Theory
A 651/Financial Accounting Seminar
A 652/Advanced Auditing
A 653/Accounting for the Not-for-Profit Organization
A 654/Financial Statements: Reporting and Analysis
Total credits 15

Option II: Managerial Accounting

Any five of the following:

A 621/Managerial Accounting
A 641/Accounting Information Systems
A642/Operational Auditing
A 661/Managerial Accounting Seminar
FI 615/Finance
FI 645/Corporate Financial Theory
FI 651/Portfolio Management and Capital Market Analysis
Total credits 15

Option III: Accounting Information Systems

A 641/Accounting Information Systems
A 642/Operational Auditing
A 652/Advanced Auditing

Plus any two accounting systems or computer science courses
Total credits **15**

Other courses may be substituted with consent of the adviser.

Applications of Psychology

Adviser: Thomas L. Mentzer, Professor of Psychology, Ph.D., Brown University

The certificate in applications of psychology is designed to assist professionals who wish to acquire specific kinds of skills in areas dealing with human services or personnel functions. Study can be tailored to the needs of either one whose master's degree is in a nonpsychological field or one with a master's degree in psychology who wishes to broaden skills to a new area of psychology. Courses will be selected depending upon the student's career objectives and academic preparation. These courses may be from the following list, but other courses, independent study or special topics courses may be chosen where appropriate.

Any five of the following:

P 610/Program Evaluation
P 621/Behavior Modification I: Principles, Theories and Applications
P 622/Behavior Modification II: Advanced Theory, Assessment and Application in Mental Retardation Settings
P 623/Psychology of the Small Group
P 625/Life Span Developmental Psychology
P 627/Attitude and Opinion Measurement
P 628/The Interview
P 629/Introduction to Psychotherapy and Counseling
P 632/Group Dynamics and Group Treatment
P 636/Abnormal Psychology
P 637/Mental Retardation: History, Theory and Practice
P 638/Psychology of Communication and Opinion Change
P 641/Personnel Development and Training
P 642/Organizational Change and Development
P 651/Organizational Behavior Modification
Total credits **15**

Computer and Information Science

Adviser: Roger G. Frey, Professor of Computer Science, Ph.D., Yale University

This certificate provides a set of courses central to the study of computers and computing. Its domain of application includes both scientific and business computing.

CS 603/Pascal Programming
CS 616/Assembly Language
CS 620/Data Structures
CS 622/Database Systems
CS 624/Software Engineering
Total credits **15**

Note: Students with insufficient computing background may be required to take CS 602 Computing Fundamentals, in order to enter other computer science courses with adequate preparation.

Finance

Adviser: Edward A. Downe, Associate Professor of Finance, Ph.D., New School for Social Research

The goal of the finance certificate is to prepare individuals for the expanding sector of financial services and modern corporate financial management. Certificate study stresses the understanding of the conceptual foundations of finance and uses of analytic techniques, with special emphasis on the implications and applications of the financial concepts. Senior certificate candidates are required to meet the prerequisites for FI 615. It is *strongly recommended* that the stu-

dent contact the finance coordinator as early as possible to plan the appropriate sequence of courses.

FI 615/Finance

Plus four of the following:

FI 617/Financial Institutions and Capital Markets
FI 619/Monetary and Central Banking Policy
FI 620/Working Capital Management and Planning
FI 645/Corporate Financial Theory
FI 649/Security Analysis
FI 651/Portfolio Theory and Capital Market Analysis
FI 655/Speculative Market Analysis
Total credits **15**

Other courses may be substituted with the written approval of the adviser.

General Management

Adviser: Robert W. Baeder, Professor of Management, Ph.D., Ohio State University

The certificate is designed to develop students' conceptual knowledge and skills in formulating corporate strategy and in determining structural and resource requirements. The program focuses on concepts and processes useful in relation to general management and on functional responsibilities in coordinating and directing the organizational effort in our ever-changing economic environment. Students should note that MG 637 is prerequisite to this program. Additional prerequisites required for some of the courses in the certificate are listed in the course descriptions elsewhere in the catalog.

MG 663/Leadership in Organizations
MG 664/Organizational Effectiveness
MG 669/Advanced Business Policy

Plus three of the following:

MG 645/Management of Human Resources
MG 660/Comparative Management
MG 662/Organization Theory
MG 680/Current Topics in Business Administration
Total credits **18**

Other management courses may be permitted as substitutions with the approval of the adviser.

Health Care Management

Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This certificate will be useful for decision makers employed in the public, private or nonprofit sectors of the health care field. Coursework will provide medical personnel with additional background and skills to enhance personal and professional development.

MG 640/Management of Health Care Organizations
PA 641/Financial Management of Health Care Organizations
PA 643/Health and Institutional Planning
PS 635/Law and Public Health

Plus one of the following:

PA 642/Health Care Delivery Systems
PA 644/Administration of Programs and Services for the Aged
PA 645/Health Care Economics and Finance
PA 646/Organization and Management of Long-Term Care Facilities
PA 647/Alternative Health Care Delivery Systems
PA 648/Contemporary Issues in Health Care
PA 670/Selected Topics
Total credits **15**

The certificate in long-term health care, leading to eligibility for the State of Connecticut licensing examination in long-term care administration, is described on page 89.

Hotel and Restaurant Management

Adviser: James F. Downey, Professor of Hotel and Restaurant Management, Ph.D., Purdue University

This certificate is designed to develop analytic skills necessary for the competent and profitable operation of a hospitality facility. It expands the student's awareness in and underscores the importance of those financial, economic, marketing and statistical factors which contribute to the success of a hospitality operation.

HR 605/Hospitality Corporate Law
HR 630/Personnel and Labor Relations in Hotel and Restaurant Operations
HR 635/Hospitality Industry Capital Budgeting and Managerial Accounting
HR 650/Hospitality Corporate Marketing
HR 655/Development of Hotel and Restaurant Operations
HR 670/Selected Topics
Total credits 18

Human Resources Management

Adviser: Judith A. Neal, Associate Professor of Management, Ph.D., Yale University

This certificate is designed for the personnel professional or persons in other fields who aspire to the personnel function. It also serves the needs of the individual whose previous degrees are not related to human resources management or who is looking for an update without necessarily pursuing a specialized degree.

MG 645/Management of Human Resources
MG 678/Personnel Management Seminar

Plus four of the following:

EC 625/Industrial Relations
EC 627/Economics of Labor Relations
EC 687/Collective Bargaining
MG 663/Leadership in Organizations
MG 664/Organizational Effectiveness
MG 665/Compensation Administration
MG 679/Industrial Relations Seminar
P 627/Attitude and Opinion Measurement
P 628/The Interview
P 641/Personnel Development and Training
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
Total credits 18

Course substitutions may be permitted depending upon the background of the student and subject to the approval of the adviser.

International Business

Adviser: Michael Kublin, Associate Professor of Marketing and International Business, Ph.D., New York University

This certificate is designed to prepare managers to deal with the current problems and methods of analysis related to international business. This includes basic techniques and skills, such as adapting to new political and cultural environments, which are not normally covered by traditional courses.

FI 644/International Financial Management
IB 643/International Business

Plus three of the following:

EC 641/International Economics
IB 645/Comparative International Business Environments
IB 651/International Marketing
IB 652/Multinational Business Management
IB 660/East and Southeast Asian Business Systems
MG 660/Comparative Management
Total credits 15

Marketing

Adviser: David J. Morris, Jr., Associate Professor of Marketing, Ph.D., Syracuse University

The certificate in marketing allows the student to acquire a deeper understanding of marketing phenomena and to develop

analytic skills. Special emphasis is given to the development of content knowledge and skills necessary for operating managers of the marketing function. It is suggested that Marketing Management and Marketing Research and Information Systems, if taken, be preceded by other courses in the program. Note that MK 609 and MG 637 are prerequisites for the certificate.

Option I: Marketing

MK 641/Marketing Management

Plus one course in international business and three of the following:

MG 669/Advanced Business Policy
MK 616/Buyer Behavior
MK 638/Competitive Marketing Strategy
MK 639/Marketing Research and Information Systems
MK 643/Product Management
MK 645/Distribution Strategy
MK 680/Marketing Workshop
Total credits 15

Option II: Quantitative Techniques in Marketing

This specialization will enable the student to utilize the latest quantitative methods to redefine and to plan the corporate scope of a business. It is critical for problem solving at both strategic and tactical levels. Particular emphasis is placed on marketing distribution problems by the intensive study of transportation and logistics.

CS 606/FORTRAN Programming
QA 604/Probability and Statistics

Plus three of the following:

IE 615/Transportation and Distribution
MK 639/Marketing Research and Information Systems
MK 641/Marketing Management
QA 607/Forecasting
Total credits 15

Occupational Safety and Health Management

Adviser: Brad T. Garber, Professor of Occupational Safety and Health, Ph.D., University of California, Berkeley

This senior professional certificate prepares individuals to manage a comprehensive safety and health program. It is designed to fit the needs of those persons who already hold an advanced degree but who desire specific training in this dynamic field. The wide variety of course offerings allows students to select courses that best meet their individual needs.

Any five of the following:

SH 602/Safety Organization and Administration
SH 605/Industrial Safety Engineering
SH 608/Industrial Hygiene Practices
SH 615/Toxicology
SH 620/Occupational Safety and Health Law
SH 630/Product Safety and Liability
SH 660/Industrial Ventilation
SH 661/Microcomputers in Occupational Safety and Health
SH 665/Occupational Safety and Health Measurements
Total credits 15

Other courses may be substituted with consent of the adviser.

Public Management

Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This certificate in public management is designed to provide a broad overview of the most up-to-date thinking in public management. Courses emphasize conceptual and analytic skill building. Students may select either a survey of the field or public personnel management.

Option I: Survey of the Field

Any five of the following:

EC 665/Urban and Regional Economic Development
PA 611/Research Methods in Public Administration
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 625/Administrative Behvaior
PA 630/Fiscal Management for Local Government
PA 632/Public Finance and Budgeting
PA 660/Urban Planning: Theory and Practice
PS 608/The Legislative Process
Total credits 15

Option II: Public Personnel Management

EC 625/Industrial Relations
MG 645/Management of Human Resources
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 625/Administrative Behavior

Plus one of the following:

MG 665/Compensation Administration
P 627/Attitude and Opinion Measurement
P 635/Assessment of Human Performance with Standardized Tests
Total credits 15

Public Safety Management

Adviser: Frederick Mercilliott, Professor of Professional Studies, Ph.D., City University of New York; D.A., Western Colorado University

This senior professional certificate includes additional courses and a further educational goal for those public safety professionals who have already completed the master's degree.

FS 681/Seminar/Research Project in Public Safety Management I
FS 682/Seminar/Research Project in Public Safety Management II
FS 683/Seminar/Research Project on Comparative Public Safety Systems

Plus one of the following:

CO 631/Public Information Dynamics
EC 665/Urban and Regional Economic Development
MG 645/Management of Human Resources
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 630/Fiscal Management for Local Government
PA 660/Urban Planning: Theory and Practice
PS 635/Law and Public Health
SH 602/Safety Organization and Administration
SH 620/Occupational Safety and Health Law
Total credits 12

Taxation

Adviser: Robert E. Wnek, Associate Professor of Tax Law, Accounting and Business Law, LL.M., Boston University School of Law, C.P.A.

This certificate is for practitioners who wish to improve or update their tax skills, including practicing C.P.A.s needing continuing education credits and others seeking to expand their tax backgrounds.

Option I: Taxation of Individuals

A 601/Individual Income Taxation
A 602/Sales and Exchanges of Property
A 603/Qualified Retirement Plans
A 608/Estate and Gift Taxation

Plus one taxation elective
Total credits 15

Option II: Taxation of Corporations

A 604/Corporate Income Taxation I
A 605/Corporate Income Taxation II
A 610/Consolidated Returns

Plus two taxation electives
Total credits 15

Other courses may be substituted with consent of the adviser.

Telecommunication Management

Adviser: Jerry L. Allen, Professor of Communication, Ph.D., Southern Illinois University

This certificate is designed to prepare telecommunication managers to deal with the current problems and methods of analysis pertinent to this fast-changing field and to end users, suppliers and common carriers of telecommunications services and facilities. Courses emphasize conceptual factors and analytic skills.

CO 640*/Communications Technologies
CO 643/Telecommunications Policy and Strategy

Plus any three of the following:

CO 641/Competition and Regulation in Telecommunications
CO 642/Management of Telecommunications Organizations
CS 642/Computer Networks and Data Communication
LA 673/Business Law I: Contracts and Sales
MG 638/Cost Benefit Management
Total credits **15**

**Students who have had the equivalent of CO 640, either through work experience or educational courses given by a common carrier, may substitute another elective from the elective list or another course with the consent of the adviser.*

Professional Certificates

These certificates are available to persons having undergraduate degrees who want to continue study at the graduate level.

Inasmuch as the professional certificate is not a degree, a student may transfer credits earned toward a certificate into a master's program at any time, subject to the requirements of the master's program and the decision of the coordinator of the master's program, and to acceptance in the master's program.

A student who completes work required for a certificate does not attend commencemen. A petition for certification must be filed with the Graduate Registrar and the appropriate fee paid. When the coursework is reviewed and found complete, the certificate will be mailed to the student. A minimum QPR of 3.00 is required in courses taken at the university as part of the professional certificates.

Professional Certificate Requirements

Coursework consists of 12 to 21 credits, depending upon the area chosen. Students, having chosen the area of study, should contact the adviser who is listed for that particular area. Students must meet all course prerequisite requirements.

Course waivers are not permitted for professional certificates; course substitutions may be granted by the adviser.

Courses of Study

A number of professional certificates are available for qualified students. They are as follows:

Arson Investigation
Civil Engineering Design
Criminal Justice/Security Management
Fire Science Administration and Technology
Forensic Science/Advanced Investigation
Forensic Science/Criminalistics
Forensic Science/Fire Science
Health Care Management
Human Resources Management
Industrial Hygiene
International Relations
Legal Studies
Logistics
Logistics/Advanced
Long-Term Health Care
Mental Retardation Services
Occupational Safety
Public Administration

Arson Investigation

Adviser: Frederick Mercilliott, Professor of Professional Studies, Ph.D., City University of New York; D.A., Western Colorado University

This certificate offers an opportunity for students who hold the baccalaureate degree to continue their study of arson investigation at the graduate level.

Any four of the following:

CJ 608/Law and Evidence
CJ 649/Fire Scene Investigation and Arson Analysis (4 credits)
FS 665/Legal Aspects of Fire and Arson Investigation
FS 667/Fire and Building Codes, Standards and Practices
FS 668/Fire and Casualty Insurance Practices
FS 669/Dynamics, Evaluation and Prevention of Structural Fires
FS 670/Selected Topics
Total credits **12-13**

Civil Engineering Design

Adviser: David J. Wall, Professor of Civil and Environmental Engineering, Ph.D., University of Pittsburgh

The certificate in civil engineering design provides professional studies beyond the baccalaureate level in the major disciplines within civil engineering. The student, with the adviser, selects courses that best satisfy the student's professional interests. Areas of specialization are construction, geotechnical engineering, hydraulics and hydrology, and structural engineering. Accreditation application to the Board of Governors for Higher Education, State of Connecticut, for this certificate in civil engineering design is in process.

Candidates for admission will be expected to have an engineering degree from a program accredited by the Accreditation Board for Engineering and Technology (ABET). Engineering degrees presented from foreign institutions will be evaluated individually. Candidates are required to complete six courses or a total of 18 credits for the certificate. Courses must be selected, with the adviser's approval, from the following:

CE 620/Engineering Hydrology
CE 621/Advanced Hydrology
CE 623/Open Channel Hydraulics
CE 624/Computer Applications in Hydrology/Hydraulics
CE 627/Groundwater Hydrology
CE 630/Reinforced Concrete Design
CE 631/Structural Steel Design
CE 632/Load and Resistance Factor Design for Structural Steel
CE 633/Wood Engineering
CE 634/Prestressed Concrete Design
CE 640/Structural Analysis
CE 650/Soil Mechanics I
CE 651/Soil Mechanics II
CE 652/Foundation Engineering I
CE 653/Foundation Engineering II
CE 660/Project Planning
CE 678/Computer Applications in Civil Engineering
LA 673/Business Law I: Contracts and Sales
Total credits **18**

Criminal Justice/Security Management

Adviser: David A. Maxwell, Professor of Criminal Justice, M.A., John Jay College; J.D., University of Miami

The certificate is designed for those professionals who wish to enhance their knowledge and skills in security management. Application for admission to the professional certificate in security management is open to all persons who hold an undergraduate degree from an accredited institution of higher education.

CJ 612/Criminal Justice Management
CJ 669/Dynamics, Evaluation and Prevention of Structural Fires
CJ 675/Private Security Law
CJ 676/Security Management Seminar
CJ 677/Private Security in Modern Society

SH 602/Safety Organization and Administration
Total credits **18**

Fire Science Administration and Technology

Adviser: Frederick Mercilliott, Professor of Professional Studies; Ph.D., City University of New York; D.A., Western Colorado University

This certificate in fire science provides a course of study for fire, public safety, insurance and security professionals who need to acquire the latest administrative and technological techniques in the field of fire science.

Candidates for the professional certificate in fire science administration and technology are required to have a B.S. degree in fire science or a related field. Candidates are required to complete seven courses or a total of 21 credits, including:

FS 625/Chemistry of Fires and Explosions
FS 667/Fire and Building Codes, Standards and Practices
FS 668/Fire and Casualty Insurance Practices
FS 669/Dynamics, Evaluation and Prevention of Structural Fires

Plus any three of the following:

CJ 677/Private Security in Modern Society
CJ 695/Independent Study
FS 670/Selected Topics
P 619/Organizational Behavior
P 695/Individual Intensive Study I
SH 602/Safety Organization and Administration
SH 620/Occupational Safety and Health Law
Total credits **21**

Forensic Science/Advanced Investigation

Adviser: R.E. Gaensslen, Professor of Forensic Science, Ph.D., Cornell University

CJ 614/Survey of Forensic Science
CJ 616/Advanced Crime Scene Investigation
CJ 632/Advanced Investigation I
CJ 633/Advanced Investigation II

Plus two of the following:

CJ 608/Law and Evidence
CJ 620/Advanced Criminalistics I
CJ 640/Advanced Criminalistics II
CJ 653/Physical Analysis in Forensic Science
CJ 661/Medicolegal Investigation and Identification
CJ 673/Biomedical Methods in Forensic Science
PS 605/Criminal Law
Total credits **18**

Forensic Science/Criminalistics

Adviser: R.E. Gaensslen, Professor of Forensic Science, Ph.D., Cornell University

CJ 620/Advanced Criminalistics I
CJ 621/Advanced Criminalistics I Laboratory (one credit)
CJ 640/Advanced Criminalistics II
CJ 641/Advanced Criminalistics II Laboratory (one credit)
CJ 653/Physical Analysis in Forensic Science
CJ 654/Physical Analysis in Forensic Science Laboratory (one credit)
CJ 673/Biomedical Methods in Forensic Science
CJ 674/Biomedical Methods in Forensic Science Laboratory (one credit)

Plus one of the following:

CH 621/Chemical Forensic Analysis with Laboratory (four credits)
CH 631/Advances in Analytic Chemistry
CJ 610/Administration of Justice
CJ 614/Survey of Forensic Science
Total credits **19 or 20**

Forensic Science/Fire Science

Adviser: R.E. Gaensslen, Professor of Forensic Science, Ph.D., Cornell University

CJ 640/Advanced Criminalistics II
CJ 649/Fire Science Investigation and Arson Analysis (four credits)
CJ 653/Physical Analysis in Forensic Science
FS 665/Legal Aspects of Fire and Arson Investigation

Plus any two of the following:

CH 625/Chemistry of Fires and Explosions
CJ 614/Survey of Forensic Science
CJ 667/Fire and Building Codes, Standards and Practices
CJ 668/Fire and Casualty Insurance Practices
CJ 669/Dynamics, Evaluation and Prevention of Structural Fires
CJ 684/Fire/Accident Scene Reconstruction
CJ 693/Criminal Justice Internship I
Total credits 19

Health Care Management

Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This certificate will be useful for professionals employed in the public, private or non-profit sectors of the health care field. Coursework will provide students with skills necessary for personal development and increased professionalism as well as the opportunity for organizational advancement.

MG 640/Management of Health Care Organizations
PA 641/Financial Management of Health Care Organizations
PA 643/Health and Institutional Planning
PS 635/Law and Public Health

Plus two of the following:

PA 642/Health Care Delivery Systems
PA 644/Administration of Programs and Services for the Aged
PA 645/Health Care Economics and Finance
PA 646/Organization and Management of Long-Term Care Facilities
PA 647/Alternative Health Care Delivery Systems
PA 648/Contemporary Issues in Health Care
PA 670/Selected Topics
Total credits 18

Human Resources Management

Adviser: Judith A. Neal, Associate Professor of Management, Ph.D., Yale University

This certificate is designed for the human resources professional or the individual in another field who aspires to work in human resources management. It provides an overview of the field and an opportunity to study various subfunctions (such as training, compensation or industrial relations) in greater depth.

Candidates for the professional certificate in human resources management are required to have a B.S. in business administration or a related field. Candidates are required to complete six courses, or a total of 18 credits, including:

MG 637/Management
MG 645/Management of Human Resources
MG 678/Personnel Management Seminar

Plus three of the following:

EC 625/Industrial Relations
EC 687/Collective Bargaining
MG 664/Organizational Effectiveness
MG 665/Compensation Administration
P 619/Organizational Behavior
P 628/The Interview
P 641/Personnel Development and Training
P 642/Organizational Change and Development
P 643/The Psychology of Conflict Management
SH 602/Safety Organization and Administration
Total credits 18

Industrial Hygiene

Adviser: Brad T. Garber, Professor of Occupational Safety and Health, Ph.D., University of California, Berkeley

This certificate is designed for practicing professionals who wish to increase their knowledge and skills in industrial hygiene as well as for persons who wish to enter this field. Courses of study are individually tailored to the specific occupational needs of each applicant.

A total of 15 credits in industrial hygiene, toxicology and related fields must be completed. Students, in consultation with the adviser, will design a course of study consisting of the following offerings or approved substitutes.

Any five of the following:

SH 602/Safety Organization and Administration
SH 608/Industrial Hygiene Practices
SH 611/OSH Research Methods and Techniques
SH 615/Toxicology
SH 660/Industrial Ventilation
SH 661/Microcomputers in Occupational Safety and Health
SH 665/Occupational Safety and Health Measurements
Total credits **15**

Other courses may be substituted with consent of the adviser.

International Relations

Adviser: James W. Dull, Professor of Political Science, Ph.D., Columbia University

This certificate is designed to introduce students to elements of international life that are relevant to the growth of a global political-economic system. Courses will provide increased knowledge and awareness in the area of international relations for corporate executives, teachers and professionals. Factors such as power, diplomacy, law, trade, monetary affairs, multinational corporations, investment, aid and differing cultural and geographical characteristics will be examined.

HS 607/World History in the Twentieth Century
PS 606/Advanced International Relations
PS 641/The Politics of the World Economy

Plus one of the following:

HS 670/Selected Topics
HS 695/Independent Study
IB 643/International Business
PS 603/International Law
PS 604/Human Rights and the Law
PS 625/Transnational Legal Structures
PS 628/Change and Government
PS 645/Government and the Industrial Sector
PS 670/Selected Topics
PS 695/Independent Study
Total credits **12**

Legal Studies

Adviser: James W. Dull, Professor of Political Science, Ph.D., Columbia University

This certificate is designed to provide the student with a background in and orientation to constitutional and legal issues in contemporary American and global societies by exploring basic constitutional principles and the levels at which legal conflicts may arise. Students will be introduced to basic principles and practices in the American legal system, including some elements that pertain to international activity, and will learn to recognize areas of potential legal conflict at all levels of the system–legislative, judicial, administrative and regulatory.

PS 601/Constitutional Law
PS 610/Legal Methods I
PS 655/Conflict Resolution

Plus one of the following:

LA 673/Business Law I: Contracts and Sales
PA 650/Administrative Law

PS 602/Civil Liberties and Rights
PS 603/International Law
PS 604/Human Rights and the Law
PS 605/Criminal Law
PS 608/The Legislative Process
PS 612/Contracts, Torts and the Practice of Law
PS 616/Urban Government
PS 617/Law, Science and Ethics
PS 625/Transnational Legal Structures
PS 626/Decision Making in the Political Process
PS 628/Change and Government
PS 633/The Political Process and the Aged
PS 635/Law and Public Health
PS 640/Law and Education
PS 645/Government and the Industrial Sector
PS 670/Selected Topics
PS 695/Independent Study
Total credits 12

Logistics

Adviser: Alexis N. Sommers, Professor of Industrial Engineering, Ph.D., Purdue University

This certificate provides a basic working knowledge of logistics and background for certification in the discipline. Although an old field of study traditionally associated with the military, logistics has emerged as an important management specialty in organizations dealing with complex systems and large, multiphase projects. Modern logistics is the science of making sure that needs are met when they occur, at a reasonable resource expenditure. This necessitates customer requirements planning, design-to-cost concepts, optimal system acquisition, life cycle analysis, transportation and distribution, and field support networks. Especially in defense industries, logistics is essential in designing, acquiring and introducing new weapons systems, new communication and supply systems, and advanced production and distribution concepts.

LG 660/Logistics Technology and Management

Plus three of the following:

IE 615/Transportation and Distribution
LG 663/Logistics Management in the System Acquisition Process
LG 665/Integrated Logistics Support Analysis
LG 669/Life Cycle Cost Analysis
MG 638/Cost Benefit Management
Total credits 12

Logistics/Advanced

Adviser: Alexis N. Sommers, Professor of Industrial Engineering, Ph.D., Purdue University

This certificate provides advanced training for logistics professionals who seek to continue their education. For the logistics professional employed in the defense industry, a working knowledge of logistics strategy, new logistics research and the impact of high technology is an essential part of professional development. This certificate is open to those students who have a background in logistics, such as completion of the university's M.B.A. program with a concentration in logistics or equivalent logistics training.

LG 672/Designing for Logistics Support
LG 673/Human Engineering in Logistics Support
LG 675/Logistics Techniques and Policy
LG 676/Logistics Products
Total credits 12

Long-Term Health Care

Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This certificate is approved by the Department of Health Services, State of Connecticut, as a course of study in long-term health care. Students who complete this 12-credit course of study are eligible to take the state licensing examination for long-term care administration, preparing individuals for participation in this area of expanding opportunities for health care practitioners.

In the following sequence, PA 646 must be taken before or concurrently with PA 681; PA 682 must be taken after PA 681 and PA 646. No waivers, substitutions or transfer credits will be permitted for this certificate.

PA 641/Financial Management of Health Care Organizations
PA 646/Organization and Management of Long-Term Care Facilities
PA 681/Long-Term Health Care Internship I
PA 682/Long-Term Health Care Internship II
Total credits 12

Mental Retardation Services

Adviser: Robert Hoffnung, Professor of Psychology, Ph.D., University of Cincinnati

This certificate encompasses those courses from the mental retardation services concentration in the master's program in community psychology which are most directly related to the graduate training of professionals in the field of mental retardation. The certificate emphasizes those skill areas, particularly behavior modification techniques, which are needed by professionals working in residential facilities for mentally retarded adults.

P 605/Survey of Community Psychology
P 621/Behavior Modification I: Principles, Theories and Applications
P 622/Behavior Modification II: Advanced Theory, Assessment and Application in Mental Retardation Settings
P 637/Mental Retardation: History, Theory and Practice
Total credits 12

Occupational Safety

Adviser: Brad T. Garber, Professor of Occupational Safety and Health, Ph.D., University of California, Berkeley

This certificate is designed for professionals who wish to increase their knowledge and skills in occupational safety as well as for persons who wish to enter this field. Courses of study are individually tailored to the specific occupational needs of each applicant.

A total of 15 credits in the safety and hygiene field must be completed. Students, in consultation with the adviser, will design a course of study consisting of the following offerings or approved substitutes.

Any five of the following:

SH 602/Safety Organization and Administration
SH 605/Industrial Safety Engineering
SH 608/Industrial Hygiene Practices
SH 611/OSH Research Methods and Techniques
SH 620/Occupational Safety and Health Law
SH 630/Product Safety and Liability
SH 661/Microcomputers in Occupational Safety and Health
SH 665/Occupational Safety and Health Measurements
Total credits 15

Other courses may be substituted with consent of the adviser.

Public Administration

Adviser: Charles Coleman, Assistant Professor of Public Administration, M.P.A., West Virginia University

This certificate is designed to provide training at the graduate level for people in public service. Coursework focuses on the analytic, quantitative, administrative and managerial knowledge and skills needed to meet the complex problems and responsibilities of government organizations.

PA 601/Principles of Public Administration
PA 602/Public Policy Formulation and Implementation
PA 611/Research Methods in Public Administration
PA 620/Personnel Administration and Collective Bargaining in the Public Sector
PA 632/Public Finance and Budgeting

Plus one of the following:

EC 608/Economics for Public Administrators
PA 604/Communities and Social Change
PA 625/Administrative Behavior
PA 670/Selected Topics
Total credits 18

COURSES

Unless otherwise indicated, all graduate courses carry three credit hours. For purposes of brevity, course descriptions may not follow traditional rules of grammar. Course descriptions are arranged alphabetically by prefix code, not by subject title.

Accounting

A 600 Accounting
The principles and procedures underlying the generation of financial accounting information. No credit.

A 601 Individual Income Taxation
A study of tax policy and the fundamental principles of the federal income tax law taught at an advanced level of inquiry. Coverage entails the key concepts of gross income, adjusted gross income, deductions, exemptions, credits and special tax computations, with attention given to the provisions of the Internal Revenue Code affecting individual taxpayers.

A 602 Sales and Exchanges of Property
Prerequisite: A 601. A continuation of Individual Income Taxation emphasizing the fundamental principles concerning dispositions of property: analysis of basis, recognition of gain or loss, capital asset transactions, non-recognition exchanges and depreciation recapture.

A 603 Qualified Retirement Plans
Prerequisite: A 602. An examination of the fundamentals of the federal taxation of deferred compensation. The course will focus on qualified retirement plans and individual and self-employed retirement plans as developed by the Employment Retirement Income Security Act of 1974 and subsequent legislation. Deferred executive compensation arrangements, stock options, restricted property, tax deferred annuities and various employee benefit plans will also be reviewed.

A 604 Corporate Income Taxation I
Prerequisite: A 602. A foundation course analyzing the basic federal income tax provisions affecting corporations and shareholders. Course coverage includes organization of the corporation, corporate capital structure, corporate distributions, stock redemptions, bailout techniques and liquidations.

A 605 Corporate Income Taxation II
Prerequisite: A 604. Advanced study in the corporate tax area including Subchapter S corporations, collapsible corporations, accumulated earnings and personal holding company taxes, affiliated corporations, carryover of corporate tax attributes, and corporate reorganizations and divisions.

A 607 Tax Accounting
Prerequisite: A 601. Investigation of such areas as: problems of allocating income and deductions to the proper tax year, permissible tax accounting methods, depreciation, inventory methods, individual net operating losses, change in accounting methods, and comparison of business and tax accounting principles.

A 608 Estate and Gift Taxation
A comprehensive introduction to, and analysis of, the federal estate and gift tax laws including basic principles of estate planning. Procedures for preparation of the estate and gift tax returns are treated. Coverage is given to state death and inheritance taxes.

A 609 State and Local Taxation

Tax problems encountered at the state and local level by businesses engaged in interstate commerce. Federal limitations on the taxation of multistate enterprises and jurisdictional problems are examined. Specific areas covered are: license to do business, net income, franchise, gross receipts, property, and sales and use taxes. Apportionment problems are examined in detail.

A 610 Consolidated Returns

Prerequisite: A 604. A thorough analysis of the federal consolidated tax return provisions including eligibility and whether to file a consolidated return, intercompany transactions and deferral concepts, basis in the disposition of stock of a subsidiary, computation of earnings and profits, mechanics of preparing the consolidated return.

A 611 Income Taxation of Estates and Trusts

Prerequisite: A 602. Federal income taxation of estates, trusts, grantors and beneficiaries. Topics are simple and complex trusts, throwback rules, taxable and distributable net income, assignment of income concepts and income in respect of a decedent, preparation of the estate and trust returns.

A 612 International Taxation

Prerequisite: A 604. Consideration of the federal income tax treatment of nonresident aliens and foreign corporations and the foreign income of U.S. residents and domestic corporations; comparison of alternative methods of engaging in operations abroad; foreign tax credit; allocations under code Section 482; Section 367 rulings; and the effect of tax treaties.

A 613 Taxation of Partnerships and Partners

Prerequisite: A 602. A study of the federal income tax problems encountered in the formation and operation of a partnership including computations of taxable income, sale of a partnership interest, withdrawal of a partner, death or retirement of a partner, distribution of partnership assets and basis adjustments.

A 614 Federal Tax Practice and Procedure

Prerequisite: A 601. A study of the history and organization of the Internal Revenue Service, the selection of returns for audit and the review steps at the administrative level. Code provisions covered will include: filing requirements, statutory notices, restriction on assessment, statute of limitations, refund procedures, waivers, closing agreements, protests and rulings.

A 615 Research Project in Federal Income Taxation

Prerequisite: 15 graduate hours in taxation. A study of the techniques and tools of tax research. Reference sources include: tax loose-leaf services, I.R.S. cumulative bulletins, court cases, congressional committee reports, textbooks, published articles. Research projects will be assigned for written submission.

A 616 Taxation for Management

Introduction to federal taxation and its impact on business decision making. Overview of the basics of federal taxation, its traps and tax planning opportunities. Complete overview of all areas of federal taxation to understand the tax planning for personal and business situations and the interrelationship of tax planning decisions. Areas of federal taxation covered are: individual income taxes, corporation income taxes, S corporations, partnerships, income taxation of estates and trusts, estate and gift taxes. *Not open to M.S. in taxation program students.*

A 617 Estate Planning

Prerequisite: A 608. The essential elements of estate planning under current law. Includes gift planning as well as death transfers in the general context of family financial planning; also, personal planning considerations, as well as tax savings. State succession taxes will be reviewed.

A 621 Managerial Accounting

Prerequisite: A 600 or six credits in financial accounting. Accounting analysis for the managerial functions of planning, controlling and evaluating the performance of the business firm.

A 641 Accounting Information Systems

Prerequisite: A 621. An examination of the function and limitations of internal accounting information systems and their relationship to other decision-oriented business information systems.

A 642 Operational Auditing
Prerequisite: A 621. Analysis of the principles underlying the functions of auditing within a firm. Will impart a working knowledge of techniques used in business audits.

A 650 Advanced Accounting Theory
Prerequisite: six hours of intermediate accounting. Theoretical aspects of accepted accounting principles and their significance as a frame of reference for the valuation of accounting practices. Major focus on the role of regulatory agencies and professional accounting organizations with regard to their influences on accounting theory and practice.

A 651 Financial Accounting Seminar
Prerequisite: A 650. An examination and evaluation of current literature in external accounting issues and related fields.

A 652 Advanced Auditing
Prerequisite: three hours of auditing. An analysis of the contemporary problems surrounding the attest function performed by the professional independent auditor. EDP auditing is examined in depth.

A 653 Accounting for the Not-for-Profit Organization
Prerequisite: six hours of intermediate accounting. An intensive examination of the contemporary views toward financial reporting for not-for-profit organizations.

A 654 Financial Statements: Reporting and Analysis
Prerequisite: A 621. Techniques in analyzing financial statements by creditors and equity investors for the short and long term. Review of accounting principles as reflected in the financial statements.

A 661 Managerial Accounting Seminar
Prerequisite: A 621. Case course covering advanced issues of management accounting. Develops topics introduced in A 621.

A 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. Course may be taken more than once.

A 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

A 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

A 696 Independent Study II
A continuation of Indepen-dent Study I.

A 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

A 699 Thesis II
A continuation of Thesis I.

Civil and Environmental Engineering

CE 601 Water Treatment
Advanced design principles and practices in water treatment processes; study of unit processes and operations; water treatment plant design ; methods of population projection; water distribution systems.

CE 602 Wastewater Treatment
Advanced design principles and practices in sewage treatment processes; study of unit processes and operations; secondary sewage treatment plant design; sludge handling and disposal; sewage collection systems; introduction to advanced treatment methods.

CE 605 Solid Waste Management
Characteristics, volumes, collection and disposal of solid waste and refuse. Design of processing, recycling and recovery equipment; landfill design and operation; resource recovery; incineration.

CE 606 Environmental Law and Legislation
Review and techniques of enforcement of state and federal pollution control laws and regulations; effects on waste treatment criteria and design and evaluation of municipal ordinances; preparation of environmental assessments and impact statements.

CE 607 Water Pollution Control Processes

Prerequisite: CH 601. *This course is open to non-engineering students only.* Study of physical, chemical and biological processes employed for pollution control. Processes cover the removal of suspended, colloidal and dissolved phases of pollution.

CE 612 Advanced Wastewater Treatment

Prerequisites: CH 601, which may be taken concurrently; CE 602. Theories and principles of advanced sewage treatment including nutrient removal, demineralization, distillation, ozonization, carbon filtration, ion exchange, nitrification; design of facilities; upgrading secondary plants.

CE 613 Industrial Wastewater Control

Prerequisites: CH 601, CE 602. Characteristics of industrial wastes—volumes, sources, types; methods of volume reduction, waste segregation, recovery, recycling and waste treatment.

CE 614 Surface Water Quality Management

Prerequisites: CE 602 and CE 623, or permission of instructor. Characteristics of rivers and streams, including hydrology, response to waste load inputs and engineering controls. Waste load allocation principles. Physical and hydrologic characteristics of lakes. The response of lakes to wastewater discharges. Characteristics of estuaries. Dispersion of contaminants in estuaries, bays and harbors. Modeling of dissolved oxygen in surface waters. Study of eutrophication and the distribution of indicator bacteria, pathogens, viruses, toxic substances and temperature in surface waters.

CE 616 Groundwater Waste Disposal

Study of effects of disposal of wastewaters in groundwaters; travel of pollutants through soil; removal of nutrients and pollutants by soil interactions; leachate identification and control from refuse disposal areas.

CE 620 Engineering Hydrology

Prerequisites: undergraduate course in hydraulics; computer literacy. Theory, methods and applications of hydrology to contemporary engineering problems. Methods of data collection and analysis as well as design procedures are presented for typical engineering problems. Specific topics to be considered within this framework include the rainfall/runoff process, hydrograph analysis, hydrologic routing, urban runoff, storm water models and flood frequency analysis.

CE 621 Advanced Hydrology

Prerequisite: CE 620. Examination of water sources and losses; the evaporation and infiltration processes and their effects on stream flow hydrographs. Deterministic and stochastic methods of reservoir analysis and design for purposes of flood protection and water conservation will be investigated, as well as problems in urban hydrology.

CE 623 Open Channel Hydraulics

Prerequisite: undergraduate course in hydraulics. Basic theories of open channel flow will be presented and corresponding equations developed. Methods of calculating uniform/steady flow; gradually varied flow; and rapid, spatially varied, unsteady flow will be investigated. Flow through bridge piers, transitions and culverts will be analyzed as well as backwater curves and the design of open channels.

CE 624 Computer Applications in Hydrology/Hydraulics

Prerequisite: CE 620 and CE 623. Investigation of widely used computer software in the areas of hydrology and hydraulics. The theory underlying the programs as well as application and evaluation of software will be stressed.

CE 627 Groundwater Hydrology

Prerequisite: CE 620. Investigation of a broad range of topics in hydrogeology including the hydrologic cycle, storage and specific yield, hydraulic head and gradient, aquifer test procedures, water quality characterization, plume configuration and delineation, solute transport and groundwater modeling.

CE 630 Reinforced Concrete Design

Prerequisite: undergraduate course in concrete design and construction. Advanced topics including deep beams, slabs, composite beams, beam columns, stability, connections, creep and deflection control.

CE 631 Structural Steel Design

Prerequisite: undergraduate course in steel design and construction. Advanced topics related to the behavior and design of rigid frames (single and multistory), plate girders and connections. Plastic method of analysis and design.

CE 632 Load and Resistance Factor Design for Structural Steel

Prerequisite: undergraduate course in steel design and construction. Load and resistance factor design for steel buildings. Beams, axially loaded members and connections.

CE 633 Wood Engineering
Prerequisite: undergraduate course in wood engineering. Wood properties and determination of allowable stresses. Laminated, built-up and composite sections. Wood framing systems and connections to resist gravity and lateral loads.

CE 634 Prestressed Concrete Design
Prerequisite: undergraduate course in concrete design and construction. Analysis and design of pretensioned and posttensioned concrete structures. Beams, columns, connections, partial prestressing, deflections, anchorage.

CE 640 Structural Analysis
Prerequisite: undergraduate course in indeterminate structures. Analysis of structures having members with variable cross sections, secondary stresses, shear walls and semirigid connections. Influence lines for statically indeterminate structures.

CE 650 Soil Mechanics I
Prerequisites: undergraduate course in soil mechanics; computer literacy. The first course in a series of courses dealing with soil mechanics and foundation engineering which will give the student a better understanding of the basic principles of geomechanics. Includes: the nature of soil; soil formation; phase relationships and classification; stress, strain and strength analysis; flow analysis; and consolidation theory.

CE 651 Soil Mechanics II
Prerequisite: CE 650. Second course in the soil mechanics series. Includes: consolidation theory, settlement analysis, soil modification, compaction, lateral earth pressure, slope stability and soil exploration.

CE 652 Foundation Engineering I
Prerequisite: CE 651. The first of two courses in foundation engineering. Deals primarily with shallow foundations. Includes: types of foundations, site exploration, shear strength, bearing capacity, limit states, settlement, allowable pressure, and rafts and mats.

CE 653 Foundation Engineering II
Prerequisite: CE 652. Second course in foundation engineering. Deals primarily with deep foundations. Topics include pile foundations, pile types, pile driving, load testing, design of individual piles, group action, drilled pier foundations, construction methods and capacity in sand and clay.

CE 660 Project Planning
Application of network analogy to project planning and scheduling; resource, time and financial management. Computer applications will be included.

CE 670 Selected Topics
A study of related topics of particular interest to students and instructor. Course may be taken more than once.

CE 678 Computer Applications in Civil Engineering
Prerequisite: introductory course in computer fundamentals. The design and analysis of software and hardware systems for the solution of civil engineering problems. Includes: software engineering, software coding, evaluation of hardware and software.

CE 690 Research Project
Prerequisite: 18 graduate hours or permission of the department chair and program coordinator. Independent study under the guidance of an adviser into an area of mutual interest, each study terminating in a technical report of academic merit. Research may be in such environmental areas as water resources, stream pollution, solid waste management or air pollution.

CE 695 Independent Study I
Prerequisite: permission of program coordinator. Independent study under the guidance of an adviser into an area designated by the program coordinator.

CE 696 Independent Study II
A continuation of Independent Study I.

CE 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

CE 699 Thesis II
A continuation of Thesis I.

Chemistry

CH 601 Environmental Chemistry
Areas of consideration: the sources, reactions, transport, effects and fates of chemical species in the water, soil and air environments, as well as the influence of human activities upon these processes.

CH 602 Environmental Chemical Analysis
Prerequisite: CH 601 or equivalent. Theory and laboratory training in the applications of instrumental methods in the analysis of environmental samples. Topics include sampling techniques; chromatography, ultraviolet-visible, infrared and atomic absorption spectroscopy; mass spectrometry; nuclear magnetic resonance spectrometry; biochemical methods and use of radioisotopes. Laboratory fee required.

CH 611 Special Topics in Advanced Organic Chemistry
Advanced course dealing with topics such as stereochemistry, photochemistry, natural products and mechanisms of organic reactions.

CH 621 Chemical Forensic Analysis with Laboratory
Advanced techniques and new developments in the identification of various materials such as pigments, dyestuffs, food additives, pharmaceutical preparations, polymers, synthetic fibers and inorganic material products. Laboratory fee required. 4 credit hours.

CH 625 Chemistry of Fires and Explosions
An examination of the basic organic chemistry and combustion and explosive properties of flammable materials. The chemical principles underlying fires and explosions. Chemical properties of various synthetic materials and the products of their combustion. Fire retardant materials and chemicals used in fire extinguishment.

CH 631 Advances in Analytic Chemistry
Provides background for the recent advances made in instrumentation and current analytic techniques.

CH 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

CH 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

CH 696 Independent Study II
A continuation of Independent Study I.

CH 698 Thesis I
Prerequisite: completion of 15 credits of graduate work. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

CH 699 Thesis II
A continuation of Thesis I.

Criminal Justice

CJ 601 Seminar in Interpersonal Relations
Interpersonal communication in teaching, supervision and in various work relationships. The criminal justice worker as a resource person and facilitator of others is stressed. Humanistic psychology and interpersonal psychology provide the theoretical base.

CJ 605 Social Deviance
A survey of theories relating to the scope and nature of the crime problem. Consideration of the problems of deviancy including social norms deviancy, mental disturbances, juvenile crime and the various possible and actual responses to deviancy. Various approaches to the problem of rehabilitation.

CJ 608 Law and Evidence
Comprehensive analysis of the rules of evidence. Includes: judicial notice, presumptions, the nature of real and circumstantial evidence, hearsay evidence, confessions and admissions, and witnesses. Emphasis on evidence in criminal cases.

CJ 610 Administration of Justice
A study of all the steps of the criminal justice system from the time the accused is arrested until sentencing to a correctional facility. The objective will be to review all the problems which arise during this process and to consider some possible solutions which will benefit the individual being processed without subverting the purposes of the process.

CJ 612 Criminal Justice Management

The development of the theory and practice of criminal justice management in the United States. Significant developments and ideas of those who have made major contributions to American criminal justice management.

CJ 614 Survey of Forensic Science

An introductory survey of forensic sciences and criminalistics, crime scene procedures and documentation, and methods of laboratory analysis for students specializing in security and investigation.

CJ 616 Advanced Crime Scene Investigation

An in-depth study of crime scene procedures including recognition, protection, documentation; and collection of physical evidence; scene documentation; scene search procedures; and reconstructions from evidence and scene patterns.

CJ 620 Advanced Criminalistics I

The comparison and individualization of physical evidence by biological and chemical properties is presented in lectures and carried out in the laboratory. The theories and practice of microscopic, biological, immunological and chemical analysis are applied to the examination of blood, saliva, seminal fluid, hair, tissues, botanical evidence and other material of forensic interest.

CJ 621 Advanced Criminalistics I Laboratory

1 credit hour. Laboratory fee required.

CJ 624 Group Process in Criminal Justice

Small group interaction; both theoretical and experimental facets of group process are presented. Group counseling and encounter groups.

CJ 632 Advanced Investigation I

An in-depth study of modern principles and techniques of criminal and civil investigations. Management of investigations, use of witnesses, interviewing, polygraph, backgrounds establishment of MO, missing persons, surveillance and investigation of questioned deaths and death scenes.

CJ 633 Advanced Investigation II

An in-depth study of the principles and techniques of criminal and civil investigations. Investigation of fraud, embezzlement, white-collar crime, property crimes, sexual assaults and other crimes against persons; extortion; kidnapping; drug trades; and traffic accidents.

CJ 637 Contemporary Issues in Criminal Justice

Topics selected by students relating to current issues and concerns in the field of criminal justice. Each student will be required to write a paper and deliver an oral presentation on a selected topic.

CJ 640 Advanced Criminalistics II

Introduction of advanced microscopic, chemical and instrumental methods with extensive "hands-on" experience provided by a laboratory section. Principles and methods of analysis of microscopic and macroscopic evidence such as glass, soil, papers, inks, dyes, paints, varnishes, explosives, fibers, drugs and other potential physical traces will be discussed in class.

CJ 641 Advanced Criminalistics II Laboratory

1 credit hour. Laboratory fee required.

CJ 649 Fire Scene Investigation and Arson Analysis

The techniques of crime scene documentation and investigation as they relate to fire and explosion scenes. Evidence recognition and collection. Laboratory analysis of fire scene, arson accelerant and explosion scene residues. Scientific proof of arson. Laboratory fee required. 4 credit hours.

CJ 651 Problems in the Administration of Justice

A study of the interaction between the law enforcement official and the accused beginning with detention and/or arrest, during which time the official is seeking to secure incriminating evidence effectively while still protecting the Fourth, Fifth and Sixth Amendment constitutional rights of the "presumed innocent" accused.

CJ 653 Physical Analysis in Forensic Science

The classic firearms examination, classification and comparison of bullets and cartridges, toolmarks comparison and striation analysis, serial number restoration, document examination, voiceprint identification, fingerprints and polygraphy examination.

CJ 654 Physical Analysis in Forensic Science Laboratory

1 credit hour. Laboratory fee required.

CJ 660 Forensic Microscopy

Basic techniques of optical microscopy and the development of operational skills for the use of the microscope as a tool of evidence detection and evaluation. Microscopical measurements and analytic methods will be covered. Laboratory fee required. 4 credit hours.

CJ 661 Medicolegal Investigation and Identification

An introduction to procedures and techniques for medicolegal investigation of questioned death and identification of deceased persons, including autopsy technique, odontological procedures and anthropological approaches.

CJ 662 Forensic Toxicology

An in-depth analysis of forensic toxicological procedures and methods; determinations of metallic, volatile and soluble poisons; analysis for narcotic drugs and other drugs of abuse and dosage-form drugs that are commonly abused or found contributing to cause of death. Laboratory fee required. 4 credit hours.

CJ 663 Advanced Forensic Serology I

A comprehensive study of the theory and practice of isoenzyme, serum protein and immunoglobulin genetic markers in human blood and body fluids. Electrophoretic and isoelectric focusing techniques. Interpretation of genetic marker results in blood individualization. Laboratory fee required. 4 credit hours.

CJ 664 Advanced Forensic Serology II

A comprehensive study of the theory and practice of biochemical and immunologic procedures for blood and body fluid identification; typing of Rh, MNSs and other red cell antigens in blood and blood stains; antiserum selection and evaluation; ELISA techniques; DNA polymorphism analysis. Laboratory fee required. 4 credit hours.

CJ 667 Fire and Building Codes, Standards and Practices

The study of building and fire codes and regulations as they relate to the prevention and incidence of structural fires. Contemporary building and fire codes and practices and their enforcement. Model building codes. Fire prevention and control through building design. (See also FS 667.)

CJ 668 Fire and Casualty Insurance Practices

A study of financial risk and decision making from the investigative point of view. Insurance rate making and relation to risk and other factors. Insurance adjustment and economic factors that must be considered in fire and accident investigations. (See also FS 668.)

CJ 669 Dynamics, Evaluation and Prevention of Structural Fires

A detailed analysis of the evolution of modern structures and the mechanical systems necessary to provide safety and comfort. The effect of the nature of structures and their mechanical systems on fire behavior. Structural bases and mechanical systems for fire protection and fire prevention.

CJ 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

CJ 673 Biomedical Methods in Forensic Science

Methods and application of modern toxicology, biochemistry, pathology, dentistry and medicine in forensic science.

CJ 674 Biomedical Methods in Forensic Science Laboratory

1 credit hour. Laboratory fee required.

CJ 675 Private Security Law

A review and examination of currently applicable federal and state administrative, civil, criminal and constitutional laws as they relate to the private security industry. The framework of the course will include sources of authority and common law.

CJ 676 Security Management Seminar

Current problems, concerns, issues and legislation affecting the private security industry as they relate to and are of interest to the students and instructor.

CJ 677 Private Security in Modern Society
An introduction to current thinking and problems relating to the private security industry. The course will examine such issues as historical growth, role, mission and future of the industry. Other topics will include professionalization and ethics in the private security field.

CJ 684 Fire/Accident Scene Reconstruction
Application of principles of reconstruction of the scene of a fire or accident, including proper procedure for examining physical evidence to determine cause. Emphasis on preparation of reports, testimony for hearings and trials, rendering of advisory opinions to assist in resolution of disputes affecting life and property.

CJ 690 Research Project I
Individual guidance on a research endeavor. 1-3 credits.

CJ 691 Research Project II
Prerequisite: CJ 690. 1-3 credits.

CJ 693 Criminal Justice Internship I
The student's formal educational development will be complemented by field placement experience in various criminal justice settings or agencies. Field experience will be supervised by designated agency and departmental personnel. Students in the forensic science program using this course to fulfill the research component requirement of the core program are required to do an internship research project and must complete a fully developed work product consisting of background, methods, data and discussion.

CJ 694 Criminal Justice Internship II
Prerequisite: CJ 693.

CJ 695 Independent Study
A directed independent learning experience, the topic and format to be agreed upon by the student and supervising faculty. 1-3 credits.

CJ 697 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress toward the completion of the thesis.

CJ 698 Thesis II
A continuation of Thesis I.

CJ 699 Thesis III
A continuation of Thesis II.

Communication

CO 601 Basics of Business Media Production Techniques
A survey of the implementation of various media in the production of instructional and promotional materials specifically for the small and medium business and corporate media departments. Emphasizes both theoretical and practical problems of audio and visual systems available to the business situation, paying particular attention to the vocabulary and skills which make it possible to transfer an idea from the board room to an effective media presentation. Laboratory fee required.

CO 609 Scripting the Media Presentation
Instruction on how to select the medium appropriate to the message, write a treatment, develop a story board, script the message and use proper format.

CO 621 Managerial Communication
Major emphasis on the role of communication in a democracy and the effects of communication content. Brief treatment of content analysis techniques, person-to-person communication and barriers to the flow of communication.

CO 631 Public Information Dynamics
How the executive can best present the organization in an accurate and favorable light to the news media. Training techniques for the public relations person who will work with executives giving corporate messages internally and press statements externally.

CO 632 Contemporary Public Relations Issues
Using the case-study approach, concentrates on the problems facing management and public relations executives in businesses and other institutions. The problems change from year to year, in tune with developments in society.

CO 640 Communications Technologies
An in-depth examination for nontechnical students of technologies used with visual, voice data and character information for communicating at a distance, for storing and subsequently retrieving information and for processing information to improve communication efficiency.

CO 641 Competition and Regulation in Telecommunications

A study of proceedings before state public utility commissions and the Federal Communications Commission delineating the boundaries between those activities in the telecommunications field subject to regulation, those open to competition with restrictions and those cleared to be fully competitive. The course will include discussion and analysis of contemporary legal proceedings affecting this topic.

CO 642 Management of Telecommunications Organizations

A study and comparison of managerial systems and practices in users, manufacturers, distributors and common carriers of telecommunications facilities. Identification of criteria necessary for developing and maintaining effective telecommunications organizations. Case problems will relate largely to specific instances from this field.

CO 643 Telecommunications Policy and Strategy

Examination of management policies and strategies for the complex telecommunications organization operating in a dynamic environment, from the viewpoint of the top-level executives of the organization. Development of analytic frameworks for the management of numerous elements involved in assuring the fulfillment of the goals of the total organization. Integration of the student's general business knowledge with the content of required courses in the M.B.A. program. Emphasis is placed on the examination and discussion of cases drawn largely from the telecommunication industry.

CO 670 Selected Topics

Prerequisite: permission of adviser. An in-depth examination of a topic in the field of communication which reflects the special research of a faculty member or the special interest of a group of students. May be taken more than once.

CO 693 Internship

A program of field experience set up by the student and approved by the program adviser under the tutelage of a professional in the field.

CO 695 Independent Study I

A planned program of individual study or research in communication under the supervision of a member of the faculty.

CO 696 Independent Study II

A continuation of Independent Study I.

CO 698 Thesis I

Prerequisite: 15 graduate hours. Periodic meetings with the adviser for discussion of the individual student's progress in the preparation of a thesis.

CO 699 Thesis II

A continuation of Thesis I.

Computer Science

CS 602 Computing Fundamentals

An introduction to computers, computing and computer science, including consideration of basic concepts and technology, development of automatic computation, computer applications, organization of hardware and software systems, algorithms, flowcharts, elementary programming, number systems, survey of programming languages. *This course may not be taken for credit by students having 9 or more credits in computer science.*

CS 603 Pascal Programming

Prerequisite: CS 602 or programming experience. A first course in the programming language Pascal. It will cover all major aspects of that language. Several common algorithms will be taught as part of the process of learning the language. Students will be expected to design, code and run several Pascal programs.

CS 604 APL Programming

Introduction to the APL programming language and programming environment, including interactive coding and execution. Covers the many operators unique to the APL language, language syntax, array data objects and operations on them, function types and uses, recursive application of functions, common language idioms. Students will complete a number of APL programming projects.

CS 605 COBOL Programming
Prerequisite: CS 602 or programming experience. A first course in the business-oriented programming language COBOL. It will cover most major aspects of that language. Several common algorithms will be taught as part of the process of learning the language. Students will be expected to design, code and run several COBOL programs.

CS 605B Advanced Business Programming
Prerequisite: CS 605. Advanced programming in the COBOL language, including file organization and selected algorithms within an applied business systems context.

CS 606 FORTRAN Programming
Prerequisite: CS 602 or programming experience. A first course in the scientifically oriented programming language FORTRAN. It will cover all major aspects of that language. Several common algorithms will be taught as part of the process of learning the language. Students will be expected to design, code and run several FORTRAN programs.

CS 606B Advanced Technical Programming
Prerequisite: CS 606 and either M 610 or permission of the instructor. Advanced programming in the FORTRAN language, including selected algorithms in a scientific and technical context.

CS 607 LISP Programming
Prerequisite: CS 602 or programming experience. Introduces students to the language LISP, which is often used in artificial intelligence. Covers all major aspects of that language. Several common algorithms will be taught as part of the process of learning LISP. Students will be expected to design, code and run several LISP programs.

CS 610 C Language Programming
Prerequisite: CS 603 or CS 606. Intermediate-level course covering all major aspects of the programming language C. Several common algorithms studied as part of the process of learning the language. Students will be expected to design, code and run several C programs.

CS 612 Ada Programming
Prerequisite: CS 620 or permission of the instructor. Advanced, modern programming methodologies using the programming language Ada. Covers many aspects of the language, including: type declarations, subprograms, overloading operators, exception handling, compilation units, packages and generic program units. The study of several common algorithms. Students will be expected to design, code and run several applications which will incorporate some of the unique features of the Ada language.

CS 616 Assembly Language
Prerequisite: Any one of CS 603 through CS 610. Introduction to assembly language programming, including study of instruction types and operation, assembly language syntax and features, explicit use of memory, macros, subprograms, interrupts, I/O conversions. Major functional characteristics of the computer and its peripherals will be studied.

CS 619 Legal Protection of Computer Software
Prerequisite: CS 602 or equivalent. The legal principles involved in the protection of proprietary computer software and hardware by means of patents, copyrights and trade secrets. Software licensing and employer-employee relationships involving creative work. (See also PS 619.)

CS 620 Data Structures
Prerequisite: CS 603. An examination of data structures, their function and uses. Topics will include basic data representations, arrays, stacks, queues, linked lists, trees, graphs, and hashing. Study of the relation between data structures and algorithms, such as sorting and searching, including elementary computational complexity analysis. This course serves to cover advanced programming in Pascal and requires students to develop and run a number of programs.

CS 621 Applied Algorithms
Prerequisite: CS 620 or equivalent. Important algorithms usually omitted in earlier courses. Topics to be selected at the instructor's discretion from, but not limited to, the following: measuring performance of algorithms; external (polyphase) sorting; string searching (Boyer-Moore); partial match retrieval; range searching; quad- and oct-trees; fast Fourier transform; generating random permutations; merging, splitting and finding the k-th member of ordered lists; data encryption; and data compression.

CS 622 Database Systems

Prerequisite: CS 620. A survey of database systems, their purpose, structure, function and use. Topics will include an overview of DB systems, major DB models, design and implementation methods in DB models, introduction to typical DB systems and internal operation of DB systems.

CS 622B Advanced Database Systems

Prerequisite: CS 622. A second course in database systems covering advanced topics, fourth-generation languages and new developments in the database field. Topics include: database design methodologies and evaluation, concurrency control, recovery schemes, security, query processing, fourth-generation languages, decision support systems and new developments.

CS 624 Software Engineering

Prerequisite: CS 620. For the experienced computing student involved with software system management, design and programming. Includes: analysis of complexity, efficiency and improvement of code, strategies for large programming projects, systematic design methods, testing and debugging the human-machine interface.

CS 630 Computing Theory

Introduction to the theory of computers and computation including study of formal systems and methods; regular expressions, formal languages and grammars, elements of parsing theory, and the Chomsky hierarchy; finite automata and pushdown automata; decidability; Turing machines, Post machines and other formal computer models; and elements of complexity theory.

CS 632 Theory of Algorithms

Prerequisite: CS 620; recommended is M 615. Study of the theory of algorithms, emphasizing their nature, structure, capabilities and limitations. Consideration of general strategies of design and analysis of algorithms, including structured methods, correctness and complexity. Specific algorithmic strategies, such as combinatorial exhaustion, backtracing and branch-and-bound. Recursive function theory. Application of abstract models of computing to algorithms, including such topics as Turing machines, P- and NP-Completeness.

CS 636 Structure of Programming Languages

Prerequisites: CS 603 and knowledge of another high-level computer language. The structure, syntax and semantic aspects of computer languages will be studied. Programs will be written in the FORTH language.

CS 638 Compiler Design

Prerequisites: CS 616, CS 620, CS 630. Study of the function, structure and design of language translators, including assemblers, macroprocessors, compilers and interpreters. Topics include lexical and syntax analysis, symbol tables, memory management, relocation, linking, loading, error handling, fundamentals of code optimization and generation.

CS 640 Computer Organization

Prerequisites: CS 616, CS 620. An examination of the architecture and functional characteristics of modern digital computers, of conventional as well as state-of-the-art organization. While not a design course, it will provide the experienced computing student with detailed information needed for full understanding of issues arising in many areas of computer science work. Topics include functional aspects of a processor, machine language, microprogramming, interrupt systems, peripherals and I/O control, memory structure, parallel and pipelined architecture, supercomputers, and non-Von Neumann machines.

CS 642 Computer Networks and Data Communication

Prerequisites: CS 603, CS 616, M 610. Examines types, methods and uses of computer networking and data communication. System structure, components, software and performance. Related topic of distributed processing also studied.

CS 644 Operating Systems

Prerequisites: CS 616, CS 620. Study of the function, structure and design of computer operating systems, principally multiprogramming systems. Topics include management of processes and processor resources, of data and memory and of peripheral devices; concurrent processes; system protection; scheduling; paging and virtual systems.

CS 644B Advanced Operating Systems

Prerequisite: CS 644. A second course in operating systems and system architecture covering advanced topics, and new hardware/software developments. Includes: interprocess communication, design issues, special-purpose and multiprocessor operating systems, concurrency and access control, user interfaces, I/O devices and management, parallel architecture, fault tolerance and new developments.

CS 646 Data Parallel Programming

Prerequisite: CS 640 or equivalent. The programming techniques and algorithms used to program massively parallel computers containing possibly thousands of processors. Topics: hardware structures for parallel computing, detecting vector parallelism in sequential programs, measuring the efficiency of parallel algorithms, algorithms that benefit from data parallelism, converting algorithms to benefit from data parallelism, programming with implicit parallelism and explicit parallelism.

CS 648 Computer Systems Analysis and Selection

Prerequisites: one of CS 605B, CS 606B, CS 610, CS 620. Recommended, but not required, are CS 616, CS 640, and CS 642. Study of performance evaluation and selection of computer hardware and software systems. Consideration of requirements determination, computer structure and capability, performance testing techniques, decision and planning methods.

CS 650 Computer Graphics

Prerequisites: CS 620, M 610. The mathematical foundations for computer graphics and introduction to the current state of the art of graphics programming. Includes: 2-D and 3-D viewing, geometric transformations, clipping, segmentation, user interaction, curves, surfaces, modeling and object hierarchy.

CS 650B Advanced Computer Graphics

Prerequisite: CS 650. A second course in computer graphics covering advanced concepts such as perspective depth, hidden-surface elimination, surface fitting and surface displaying, light, color, shading, fractals, and geometric models and object hierarchy.

CS 660 Artificial Intelligence

Prerequisite: CS 607. A study of the fundamental goals and methods of artificial intelligence, the field using computers to realize apparent intelligent behavior. Includes: the design and implementation of artificial intelligence programs using the LISP language.

CS 662 Expert Systems

Prerequisite: CS 607. Principles of expert systems, artificial intelligence programs that embody knowledge of some area of human expertise and that can interact with an unskilled user to provide a cost-effective expert consultant. Examines application of expert systems in practice and how to create such systems. Students will design and implement expert systems.

CS 664 Neural Networks

Prerequisites: CS 603 and either CS 620 or permission of the instructor. Examines various connection topologies between the many, simple parallel processing elements of neural networks; the learning algorithms which train the networks; and the computational capabilities of these various configurations. Independent literature research, class presentations and software simulations of neural networks required.

CS 670 Selected Topics

Prerequisite: CS 620 or permission of the instructor. An examination of new developments or current practices in computer and information science. A topic will be selected for thorough study. Possible subject areas include data structures, recent hardware or software advances and specialized applications. Content may vary from trimester to trimester.

CS 690 Project

Prerequisite: 15 credit hours and permission of the program coordinator. Completion of a significant project under the guidance of an adviser in an area of mutual interest, such study terminating in a technical report of academic merit. For example, the project may be a survey of a technical area in computer science or may involve the solution of an actual or hypothetical technical problem.

CS 695 Independent Study I

Prerequisite: permission of the program coordinator. Independent study under the guidance of an adviser in an area designated by the program coordinator in consultation with the student.

CS 696 Independent Study II
A continuation of Independent Study I.

CS 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

CS 699 Thesis II
A continuation of Thesis I.

English

E 600 English Language Workshop
Enrollment in this course is limited to and required of students who are not native speakers of English and who lack adequate background in English instruction. Students whose TOEFL scores are less than 550 and/or students who enter the Graduate School following completion of an intensive English language program are required to take this course in the first term of enrollment. The course emphasizes development of conversation, pronunciation and composition skills and includes orientation to the Peterson Library and instruction in writing a research paper. No credit.

Economics

EC 600 Basic Economics
A basic theoretical foundation for students who lack adequate background in economics. An introduction to and review of basic economic principles. No credit.

EC 603 Microeconomic Analysis
Prerequisite: undergraduate principles of economics or EC 600. Topics in resource allocation and price determination. Theories of choice of consumers, firms, resource owners under monopoly, monopsony, competition and alternative market forms.

EC 604 Macroeconomic Analysis
Prerequisite: undergraduate principles of economics or EC 600. An examination of the roles of consumption, investment, government finance and money influencing national income and output, employment, the price level and rate of growth. Policies for economic stability and growth.

EC 608 Economics for Public Administrators
An examination of the roles of consumption, investment, government expenditure and money influencing national income, output, employment and price level, and growth rate. Special emphasis upon the roles of fiscal and monetary policy and the economics of contemporary social problems.

EC 625 Industrial Relations
A survey of the problems, strategies and policies of management and unions in conflict situations and in harmonizing labor-management relations. Labor legislation, collective bargaining and alternative strategies, productivity and other problem areas in labor-management relations are examined.

EC 627 Economics of Labor Relations
A survey of labor economics and the economics of labor relations using both the tools of economic analysis and institutional analysis. The emphasis is on the application of economics to labor problems and labor-management relations.

EC 629 Public Policies Toward Business
A survey of the economic aspects of governmental and business relations. Emphasizes the concept of public control over certain types of business and certain forms of business activity. Combination movements, pricing procedures, antitrust laws and agencies enforcing them, regulation of transportation and public utilities, rate-making for transport, pricing public utility services, consumer protection and social responsibility.

EC 633 Managerial Economics
Prerequisite: EC 603. A study of the application of the major tools of economic analysis to the problems encountered by management in the organization of the firm. Topics include the theory and measurement of consumer demand, measurement and control of costs, the effects of public policy on managerial decisions and pricing techniques and the allocation of capital within the firm.

EC 641 International Economics
A study of the basic theory and major institutions of international economic relations. Examines critically the techniques and background of protectionism and free trade and the analysis of customs, unions and price and exchange rate changes. The theory of comparative advantage; the gains from trade and the terms of trade. The balance of payments and national income. Capital movements and economic growth. The evolution of the world economy and international economic institutions. Effects of growth on trade, and trade on growth. Monopolistic practices in international trade. The international monetary system and international monetary reforms.

EC 645 Seminar in Macroeconomic Policy
Prerequisite: EC 604. The impact of fiscal and monetary policy on employment, output and prices. An analysis of past and current economic controls and their impact on the economy.

EC 653 Econometrics
Prerequisites: EC 603-604, QA 604, or permission of the instructor. A presentation of the important statistical concepts used in econometrics. Topics covered are regression theory, multiple regression, regression extensions, correlation, serial correlation, correlated regressor and error, the identification problem and selected estimating techniques.

EC 655 Economic Problems of Developing Countries
Prerequisite: undergraduate principles of economics or EC 600. A study of the modernization and economic growth in developing countries. Topics include: the role of government and planning; foreign trade, investment and technology; resource allocation; economic organization; capital formation; agricultural policies; population growth and social changes.

EC 665 Urban and Regional Economic Development
Structure of the urban and regional economy; goals, processes, problems and policy in urban and regional economic development.

EC 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

EC 687 Collective Bargaining
Prerequisite: EC 625. Emphasis on the negotiating process. The labor contract as it involves wages, worker security, management authority and handling of grievances arising during the life of the contract.

EC 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

EC 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

EC 696 Independent Study II
A continuation of Independent Study I.

EC 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EC 699 Thesis II
A continuation of Thesis I.

EC 703 Forecasting and Econometrics
Enrollment limited to doctoral students only. See p. 137 for course description.

EC 704 Public and Private Policy Interfaces
Enrollment limited to doctoral students only. See p. 137 for course description.

Electrical and Computer Engineering

EE 603 Discrete and Continuous Systems I
Prerequisite: computer programming competence. Continuous and discrete linear systems, system function. Z transforms, Fourier transforms, periodic functions, discrete Fourier series, fast Fourier transforms, Hilbert transforms. Digital processing of analog signals, sampling theorems.

EE 604 Discrete and Continuous Systems II

Prerequisite: EE 603. Review of linear vector spaces, bases, Hilbert spaces. Introduction to the similarity transformation, diagonalization of the A matrix, properties of similarity transformations, Jordan forms, quadratic forms, matrix norms, functions of A matrix, Caley-Hamilton theorem, pseudo-inverse. Mathematical modeling of physical systems, state space representation of dynamical systems, computer-oriented mathematical models. State space and linear systems, meaning of state, methods of obtaining state equations. Stability of physical systems and linear systems, linearization and stability in the small, equivalent linearization and the describing function, stability in the large and the second method of Liapunov, exact frequency domain stability criteria—Popov's method and its extension.

EE 605 Computer Controlled Systems

Prerequisites: EE 604 and EE 650. Disturbance models, design, analog design, state space design methods, pole placement design based on input-output models, optimal design methods (state space approach), optimal design methods (input-output approach), identification, adaptive control, implementation of digital controllers, reduction of the effects of disturbances, stochastic models of disturbances, continuous time stochastic differential equation.

EE 606 Robot Control

Prerequisite: EE 605. Orientation coordinate transformations, configuration coordinate transformations, Denavit-Hartenberg coordinate transformations, D-H matrix composition, inverse configuration kinematics, motion kinematics, force and torque relationships, force and moment translation, trajectories, coordinated motion, inverse dynamics, position control, feedback systems, performance measures, PID control, inverse dynamic feedforward control, nonlinear control.

EE 615 Introduction to Computer Logic

Prerequisite: any one of CS 603 through CS 610 (or equivalent). Introduction to logic elements and to their application in digital networks for processing numerical data. The course deals with analysis and design techniques of combinational and sequential networks and includes a discussion of logic variables, switching functions, optimal realizations, multivariable systems. Design examples will include logic circuits for addition, multiplication, counting, parity generation and detection.

EE 630 Electronic Instrumentation I

Prerequisite: permission of instructor. Design of modern electronic instrumentation. Circuit and system examples, evaluation and design techniques. Emphasis on practical applications including design theory and the circuit techniques used in linear integrated devices. Variety of electronic instrumentation including computer interfaces, signal conditioners, waveform generators and shapers, filters, V/F, A/D, D/A converters and other special-purpose circuits.

EE 631 Electronic Instrumentation II

Prerequisite: EE 630.

EE 634 Digital Signal Processing I

Prerequisite: EE 603. A study of the theories of digital signal processing and their applications. Topics include discrete time signals, the Z transform, the discrete Fourier transform, the FFT, homomorphic signal processing and applications of digital signal processing.

EE 635 Digital Signal Processing II

Prerequisite: EE 634.

EE 637 Power Systems Engineering I

Prerequisite: permission of instructor. Concepts and methods of analysis and design of modern power systems. Includes the network representation of power systems, matrix methods, symmetrical components and the use of the computer in the solution of problems such as short circuit fault calculations, load flow study, economic load dispatching and stability. Other topics may include protection, relaying or transmission system design.

EE 638 Power Systems Engineering II

Prerequisite: EE 637.

EE 639 Electric Power Distribution

Prerequisite: EE 637 or equivalent. Structure of electric power distribution, distribution transformers, subtransmission lines, substations, bus schemes, primary and secondary systems, radial and loop feeder designs, voltage drop and regulation, capacitors, power factor correction and voltage regulation, protection, buses, automatic reclosures and coordination.

EE 645 Introduction to Communication Systems
The analysis and design of communication systems. Includes analog and digital signals, sampling, quantization, signal representation. Analog and digital modulation, pulse code modulation, delta modulation, time and frequency multiplexing. Noise in communication systems.

EE 646 Digital Communications I
Prerequisite: EE 645. Formatting and baseband transmission, bandpass modulation and demodulation, communication link analysis, channel coding synchronization.

EE 647 Digital Communications II
Prerequisite: EE 646. Multiplexing and multiple access, spread spectrum techniques, source coding and encoding, encryption and decryption.

EE 650 Random Signal Analysis
A study of the theory of random signals and processes. Includes correlations, spectra, stationarity, ergodicity and systems with random inputs. Hilberts transforms, shot noise, thermal noise, Markoff processes, mean square estimation, spectral estimation and entropy.

EE 652 Design of Digital Filters
Techniques in the analysis and design of digital filters. Digital filter terminology and frequency responses. FIR filter design. IIR digital filter design including Butterworth and Chebyshev lowpass, highpass, bandpass and bandstop filters. The DFT and IDFT. FFT algorithms.

EE 658 Microprocessors—Theory and Applications
Prerequisite: CS 616 or equivalent. A study of the techniques and methods of designing digital systems using a microprocessor as the basic unit. Microcomputer assembly language, operating systems, input/output devices, programmable read-only memories and interfacing.

EE 670 Selected Topics
Prerequisite: permission of instructor. A study of selected topics of particular interest to students and instructor. Course may be taken more than once.

EE 680 Fiber Optic Communications
The fundamentals of lightwave technology, optical fibers, LEDs and lasers, signal degradation in optical fibers, photodetectors, power launching and coupling, connectors and splicing techniques, transmission link analysis. Includes selected laboratory experiments.

EE 681 Lightwave Technology
Prerequisite: EE 680. Advanced topics in lightwave technology. Optical fiber waveguides, transmission characteristics of optical fibers, ray theory and electromagnetic mode theories are considered. Forms of communication systems and distribution networks. Optical sources, detectors and receivers are discussed in conjunction with modulation formats and system design.

EE 685 Optimization of Engineering Systems
Prerequisite: computer programming competence. Classical min-mix theory; constraints, search methods, gradient techniques, linear programming. Measures of optimality, performance functions. Discussion of selected topics from the following: methods of Fletcher and Powell, linear programming, calculus of variations, dynamic programming, the maximum principle, nonlinear programming. Applications to design of filter networks, control systems and other engineering systems. Students will be required to complete a project.

EE 695 Independent Study
Prerequisite: permission of instructor. A planned program of individual study or research under supervision of a faculty member.

EE 697 Thesis I
Prerequisite: completion of 15 credits of graduate work. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EE 698 Thesis II
A continuation of Thesis I.

EE 699 Thesis III
A continuation of Thesis II.

Environmental Science

EN 600 Environmental Geoscience

Study of the systems of atmosphere, hydrosphere and lithosphere important in the understanding of the causes of and solutions to environmental problems. Includes material from meteorology, climatology, oceanography, geology, geophysics, geomorphology and hydrology. Some weekend field trips, or acceptable alternative, required.

EN 601 Principles of Ecology

Presentation of current topics in the various fields of ecology including community, population and ecosystem ecology. Particular emphasis on those areas related to environmental management. Some weekend field trips, or acceptable alternative, required.

EN 602 Environmental Effects of Pollutants

Prerequisites: EN 600, EN 601. The demonstrated and suspected effects of air, water and other pollutants on natural systems and on human welfare. Methods of studying effects. Some weekend field trips, or acceptable alternative, required.

EN 603 Terrestrial and Wetland Ecology

Prerequisites: EN 600, EN 601. Study of terrestrial and wetland environments and ecological processes. Characterization, description and mapping of habitats. Use of topographic maps, aerial photographs, National Wetland Inventory maps and simple survey techniques in environmental investigations. Some weekend field trips, or acceptable alternative, required.

EN 604 Ecology of Inland Waters

Prerequisites: EN 600, EN 601. Advanced study of ecological processes of inland waters, both lotic and lentic. Some weekend field trips, or acceptable alternative, required.

EN 605 Marine and Estuarine Ecology

Prerequisites: EN 600, EN 601. Advanced study of ecological processes of estuaries and marine habitats. Some weekend field trips, or acceptable alternative, required.

EN 606 Environmental Data Analysis

Prerequisite: 20 graduate hours. The application of analytic techniques to environmental data in the areas of applied ecology, environmental geology and chemistry. These include: applied univariate and multivariate statistics as well as geostatistical methods. Introduction to microcomputer software available for environmental analyses.

EN 607 Environmental Reports and Impact Assessment

Prerequisites: EN 602 plus any one of EN 603, 604, or 605. Techniques for gathering and presenting environmental data, including literature sources, transformation of field data, graphic and tabular presentation, and text preparation. Study of formats required for EIS, CAM and other common reports. Preparation of environmental impact assessments. Some fieldwork required.

EN 608 Landscape Ecology

Prerequisites: EN 600, EN 601. In-depth study of the characteristics and dynamics of terrestrial and aquatic ecosystems on a regional scale. Spatial relationships between ecosystems are examined with regard to natural ecologic and geologic functions and alterations due to human activities. Applications to land-use planning, resource management, conservation and other environmental concerns are addressed via class projects.

EN 610 Environmental Health

Prerequisite: EN 601 or undergraduate biology major. Principles of public health with general emphasis given to environmental factors such as air and water pollutants, legal standards and preventive measures and their relationships to public health.

EN 612 Epidemiology

An introduction to the principles and methods of epidemiology. Concepts of disease, analysis of morbidity and mortality as well as observational and experimental techniques considered. Illustrative examples concentrate on environmental issues.

EN 615 Toxicology

Prerequisite: introductory chemistry. Introduction to environmental and industrial toxicology; toxicologic evaluation; the mode of entry, absorption and distribution of toxicants; the metabolism and excretion of toxic substances; interactions between substances in toxicology; toxicologic data extrapolation; particulates; solvents and metals; agricultural chemicals—insecticides and pesticides; toxicology of plastics; gases; food additives; plant and animal toxins; carcinogens, mutagens and teratogens. (See also SH 615.)

EN 617 Subsurface Assessment
Prerequisites: EN 600, CH 601. Introduction to conducting subsurface contamination assessments. Includes related environmental regulations and liabilities, site hydrogeology, chemical characterization of contaminants, field methodologies, risk assessments and site contamination remediation. Some fieldwork required.

EN 618 Hazardous Materials Management
The multidisciplinary facets of managing hazardous materials and wastes. Integrates specialized knowledge from the fields of environmental biology, chemistry, engineering, hydrogeology and public health in the techniques used to maintain compliance with environmental standards. Includes regulatory framework, practical exercises and concepts of sound practices of hazardous waste management.

EN 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

EN 690 Research Project
Prerequisite: permission of the instructor. Independent study under the supervision of an adviser.

EN 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

EN 696 Independent Study II
A continuation of Independent Study I.

EN 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

EN 699 Thesis II
A continuation of Thesis I.

Executive M.B.A.

The Executive M.B.A. program consists of the following 20 modules, each four sessions in length.

EXID 903 The Communication Process
Analysis of communication and the functions of management with emphasis on perception, persuasion, conflict and change.

EXID 906 The Management Process
The role of executives and managers in administrative and operational processes. Includes organizational goals and structure, planning and performance controls and resource management.

EXID 909 Business and Government Relations
An analysis of the impact of the major regulatory agencies of the federal government upon business. Specific attention given to the legal and economic impacts of the agencies; their independence of action vis-a-vis Congress, the judiciary and each other.

EXID 915 Quantitative Decision Making
Probability and financial analysis techniques within the framework of the randomness encountered in the real world. Includes practical applications of expected values, value of information, Markov systems, game theory and decision theory.

EXID 918 Managerial Economics
Application of economic analysis to business forecasting, planning and policy formulation. Includes cost-benefit analysis, cost estimation and break-even analysis.

EXID 921 Executive Leadership Seminar
Examination of a variety of methods of executive development to be accomplished through directed self-evaluation, role-playing and observation of successful executives through on-site visits or lectures by contemporary executives.

EXID 924 Financial Management I
Analysis of financial decision models for investment, financing and dividend decisions of the profit-oriented firm. Includes capital budgeting, capital structures and the cost of capital and dividend policy.

EXID 927 Financial Management II
Analysis of financial decision models for the management of working capital. The management of current assets and the related financing mixture explored.

EXID 930 Marketing Practice
The new marketing concept and its application in the modern corporation. Organizational aspects and environmental determinants of marketing decisions are examined, culminating in a discussion of buyer behavior characteristics. Examines practical considerations in using the elements of the marketing mix: product, price, channel and promotion policy.

EXID 933 Managing the Global Marketplace
An examination of the theory and practice of a national or international company trading in world markets, focusing on strategic planning for this environment from economic, political, social, regulatory and competitive points of view.

EXID 939 Operations Research and Management
Analysis of management science techniques from the executive perspective. Focus on understanding the value of such techniques as inventory and systems modeling, queueing, linear programming and simulation with an emphasis on their roles in decision making.

EXID 942 Accounting
Examination of financial accounting standards; methods of financial statement analysis; and tools for planning, controlling and evaluating the economic performance of the firm. Includes financial statement analysis, cost systems, budgeting, standard costs and contribution reporting.

EXID 943 Federal Taxation
An introduction to federal taxation and its impact on business decision making. An overview of the basics of federal taxation, its traps and tax planning opportunities.

EXID 945 Human Resources Management
Effective management of the aggregate human resource in the modern organization. Analysis of personnel policies and procedures, manpower planning, and employee training and policies.

EXID 948 Labor and Management Relations
An examination of the evolution of the labor movement in the United States and the role that the federal government has played in the shaping of the labor laws pertinent to the collective bargaining system.

EXID 951 Marketing Management
Strategic considerations and options in managing a firm's marketing function. Scope and methods of marketing research as well as issues involved in new product management discussed. The importance, opportunities and constraints of international marketing. The unique aspects of service marketing highlighted.

EXID 954 Organizational Development
Various methods for effective organizational development in contemporary environments explored. Analysis of means to improve existing organizations in consideration of past history and changing value structures.

EXID 957 Corporate Policy and Strategy
Examination of the major management issues facing the chief executive with emphasis on resource allocation questions. Includes the strategy development process, supporting organization structure and reward system. Serves as an integrating mechanism for several preceding courses.

EXID 960 Information Management
Analysis of technologies, costs and challenges of integrating computers into the modern business environment.

EXID 999 Special Research Topics
A seminar in which the culmination of student research will be presented and critiqued, and in which state-of-the-art topics may be examined by nonfaculty guest lecturers.

Finance

FI 615 Finance
Prerequisites: A 621, EC 603, EC 604, QA 604. The investment, financing and valuation of business firms. Includes: discounted cash flow, return on investment, investment decisions under uncertainty, long- and short-term sources of funds, optimal financial structure, cost of capital, dividend policy. (Expansion, merger, working capital management and failure and reorganization may also be covered.)

FI 616 Applied Research Techniques for Financial Operations and Financial Market Analysis
Prerequisite: FI 615. Examines the ways various quantitative analytic techniques are used to improve financial decision making. Uses both mainframe and microcomputer application software.

FI 617 Financial Institutions and Capital Markets

Prerequisites: FI 615, FI 651. Financial management of financial institutions and capital markets. Analyzes the institutional and theoretical structure of monetary change and the manner in which financial institutions and markets transmit and influence the impact of monetary policy. Special attention to the role of nonmonetary financial intermediaries, the structure and regulation of capital markets and the functions of market yields as the price mechanism that allocates saving to various categories of economic investments.

FI 618 Introduction to Financial Planning

Prerequisite: FI 615. Introductory course covering the personal planning process and investment options for individuals. Computerized spreadsheets required for some assignments.

FI 619 Monetary and Central Banking Policy

Prerequisites: FI 615, FI 651. The impact of monetary change upon employment, output and prices; the formulation and execution of Federal Reserve policy designed to regulate money, credit and interest rates.

FI 620 Working Capital Management and Planning

Prerequisites: FI 615, FI 617, FI 651 or permission of instructor. The examination and understanding of working capital management, leasing, mergers and acquisitions, and overview of multinational finance.

FI 622 Financial Management of Financial Services

Prerequisites: FI 619 and FI 651. An examination of new developments and techniques in financial management applicable to deposit financial intermediaries (banks, savings and loans, savings banks, credit unions) focusing on industry structure, regulation, liquidity management, lending management, investment management and capital management.

FI 644 International Financial Management

Prerequisites: IB 643, MK 609. Focus on foreign exchange risk management and on the financing of imports and exports. Major attention also on long-run foreign investment decisions and to their evaluation, implementation and control.

FI 645 Corporate Financial Theory

Prerequisites: FI 617, FI 651 and permission of the finance adviser. An analysis of the theoretical structure supporting optimum financial decision making by the business firm. Emphasis is placed on the determination of the combination of investment, financing and dividend decisions that maximizes the valuation of the firm within a security market context.

FI 646 Advanced Capital Market Issues

Prerequisites: FI 616, FI 617. An examination of current practices and new developments in the capital markets. Various topics will be selected that highlight recent developments. The primary areas of selection will be financial and capital market innovations, monetary policy, domestic and international money markets, and financial market analytic techniques. Students required to complete a major independent research project.

FI 647 Advanced Corporate Financial Management Issues

Prerequisites: FI 616, FI 645. An examination of developments and techniques in financial management, both theoretical and practical. Selected topics highlight recent developments. The primary areas of selection will be corporate financial theory, domestic and international corporate operations, corporate financing techniques and corporate financial policy. Students required to complete a major independent research project.

FI 649 Security Analysis

Prerequisite: FI 651. An analysis of the determinants of valuation for fixed income securities, common stocks, convertible securities, options and common stock warrants. Emphasis on the information and techniques relevant to security valuation and selection and the structure and workings of the securities markets.

FI 651 Portfolio Management and Capital Market Analysis

Prerequisites: FI 615 or permission of instructor. Considers the theoretical structure for the procedures (security analysis, portfolio analysis and portfolio selection) which constitute the process of portfolio management, as well as their limitations in practice. Additional attention on the logical implications of portfolio analysis for capital market theory.

FI 655 Speculative Market Analysis

Prerequisites: FI 617, FI 651. A conceptual and operational examination of the markets in which financial futures and commodities are traded, the participants and major exchanges including an analysis of the major futures traded and the factors influencing their prices. Option valuation theory also covered.

FI 658 Financial Planning Management

Prerequisites: FI 618 and FI 649. A capstone course integrating all coursework. Cases will be used, along with computer simulation. It will be assumed that students are able to use computerized spreadsheets and statistical packages.

FI 661 Real Estate: Principles and Practices

Prerequisites: FI 615, FI 651. Real estate from the investor's point of view. Impact of taxation on real estate investments. Emphasis on commercial land use through the use of case studies and problems.

FI 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

FI 690 Research Project

Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

FI 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

FI 696 Independent Study II

A continuation of Independent Study I.

FI 698 Thesis I

Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FI 699 Thesis II

A continuation of Thesis I.

FI 701 Seminar in Financial Policy

Enrollment limited to doctoral students only. See p. 137 for course description.

Fire Science

FS 625 Chemistry of Fires and Explosions

An examination of the basic organic chemistry and combustion and explosive properties of flammable materials. The chemical principles underlying fires and explosions. Chemical properties of various synthetic materials and the products of their combustion. Fire retardant materials and chemicals used in fire extinguishment.

FS 661 Systems Approach to Fire Safety I

The systems approach to fire safety as used by fire protection engineers, fire science technicians and fire administrators in analyzing and designing fire safety in buildings. Considers the various routes that can be followed to achieve low-budget, logical, cost-effective ways of accomplishing predetermined fire safety goals.

FS 662 Systems Approach to Fire Safety II

Prerequisite: FS 661. A continuation of Systems Approach to Fire Safety I.

FS 664 Terrorism

An understanding of the problems of terrorism as well as new developments in terrorist theory and strategies. Includes background on international terrorists and terrorist organizations; terrorist profiles for the investigator; terrorist situations, actions and reactions; assassinations; hostage situations; kidnap and ransom; arson and bombings; antiterrorist organizations.

FS 665 Legal Aspects of Fire and Arson Investigation

The legal principles underlying and governing the conduct of criminal investigations, with particular emphasis on arson. The criminal law relating to arson, establishment of the crime, investigation and prosecution procedures in arson cases.

FS 666 Seminar on Industrial Fire Protection

Prepares the fire science major to make decisions on various fire protection schemes in industry and other commercial property situations. Since fire protection responsibilities are often delegated to the occupational safety or security manager, the course will provide these students with necessary background in fire protection.

FS 667 Fire and Building Codes, Standards and Practices

The study of building and fire codes and regulations as they relate to the prevention and incidence of structural fires. Contemporary building and fire codes and practices, and their enforcement. Model building codes. Fire prevention and control through building design. (See also CJ 667.)

FS 668 Fire and Casualty Insurance Practices

A study of financial risk and decision making from the investigative point of view. Insurance rate making and relation to risk and other factors. Insurance adjustment and economic factors that must be considered in fire and accident investigations. (See also CJ 668.)

FS 669 Dynamics, Evaluation and Prevention of Structural Fires

A detailed analysis of the evolution of modern structures and the mechanical systems necessary to provide safety and comfort. The effect of the nature of structures and their mechanical systems on fire behavior. Structural bases and mechanical systems for fire protection and fire prevention.

FS 670 Selected Topics

An examination and evaluation of the current and future problems faced by today's fire, public safety, insurance and security professionals.

FS 681 Seminar/Research Project in Public Safety Management I

Prerequisite: 18 undergraduate/graduate hours in a public safety discipline or permission of the program coordinator. Problems in public safety management and current techniques being used to deal with these problems. Requires a supervised research project directly related to the topic and weekly meetings with faculty throughout the term. Format for course may vary; a three-day specially scheduled seminar may be included.

FS 682 Seminar/Research Project in Public Safety Management II

A second course in the field of public safety management. See FS 681 for course description.

FS 683 Seminar/Research Project on Comparative Public Safety Systems

Prerequisite: 18 undergraduate/graduate hours in a public safety discipline or permission of the program coordinator. Examination, assessment and comparison of various approaches used in protecting the public's health and safety. Current management approaches to public safety problems. Requires a supervised research project directly related to the topic and weekly meetings with faculty throughout the term. Format for course may vary; a three-day specially scheduled seminar may be included.

FS 684 Fire/Accident Scene Reconstruction

Application of the principles of reconstruction of the scene of a fire or accident, including proper procedure for examining physical evidence to determine the cause. Emphasis on preparation of reports, testimony for hearings and trials, rendering of advisory opinions to assist in resolution of disputes affecting life and property.

FS 690 Research Seminar

Prerequisite: 30 graduate credit hours. A major research project under the supervision of the director of the fire science program.

FS 693 Internship

The student's formal educational development complemented by field experience in various fire science settings or agencies. Supervised by department faculty.

FS 695 Independent Study

A directed, independent learning experience with the topic and format to be agreed upon by the student and supervising faculty.

FS 698 Thesis I

Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

FS 699 Thesis II

A continuation of Thesis I.

Hotel and Restaurant Management

HR 600 Hotel and Restaurant Industry
Introductory course designed to familiarize graduate students with the scope of the hotel and restaurant industry with emphasis on current and future trends in management and operations. Includes: hotel and restaurant structure and staffing, sales and public relations, cost control, accounting, communications and organization procedures. No credit.

HR 605 Hospitality Corporate Law
Prerequisite: HR 600 or equivalent. An in-depth analysis of legal issues facing operators of businesses in the hospitality industry at the corporate level. Critical examination of contemporary issues resulting from the regulatory, restrictive and supplementary activities of government analyzed. Student interaction with industry, labor and government representatives and agencies encouraged. Case studies reviewed and analyzed.

HR 630 Personnel and Labor Relations in Hotel and Restaurant Operations
Prerequisite: HR 600 or equivalent. Includes: organizational behavior, personnel selection, placement, supervision, job evaluation, wage and salary administration, motivation, morale and union-management relations. Case studies and role playing are integral parts of the course.

HR 635 Hospitality Industry Capital Budgeting and Managerial Accounting
Prerequisites: HR 600 or equivalent. Investigates financial planning and control at the corporate level of hospitality industries. Investment decisions, growth and expansion strategies, planning capital structure and the cost of capital analyzed. Working capital management, capital budget and methods of finance aimed at maintaining liquidity and profitability addressed. Analysis of actual cases is supplemented by selected readings.

HR 650 Hospitality Corporate Marketing
Prerequisites: HR 600 or equivalent. Understanding the hospitality corporate market as it relates to social, psychological, environmental, economic, and personal factors for the development of strategies for cultivating new markets and new business. Strategic and decision-making aspects of hospitality marketing are stressed. Review of case studies and student interaction with industry and marketing agencies.

HR 655 Development of Hotel and Restaurant Operations
Prerequisite: HR 600 or equivalent. Examines the processes for developing profitable hospitality services. Some of the characteristics, opportunities, risks and decisions involved in starting hospitality operations studied. Emphasis on alternative financing methods and avenues.

HR 670 Selected Topics
An in-depth examination of topics in the field of hospitality which reflect the special interests of students and the instructor. May be taken more than once.

HR 690 Research Project
Prerequisite: 15 graduate hours and permission of the instructor. Independent study under the supervision of an adviser.

HR 695 Independent Study I
A planned program of individual study under the supervision of a faculty member.

HR 696 Independent Study II
A continuation of Independent Study I.

HR 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

HR 699 Thesis II
A continuation of Thesis I.

History

HS 607 World History in the Twentieth Century
A survey of major global events and trends since 1900. Advanced industrial societies emphasized, but coverage of major regions of the Third World also studied. Includes: the World Wars, patterns of economic cooperation and competition, decolonization and East-West conflicts.

HS 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

HS 695 Independent Study
A planned program of individual study or research under the supervision of a member of the faculty.

Humanities

HU 651-659 Topics in Humanities
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

HU 695 Independent Study
A planned program of individual study or research under the supervision of a member of the faculty.

International Business

IB 643 International Business
Prerequisites: EC 603, EC 604. An introduction to the political, economic, technological and cultural setting of international business. Includes: the problems, policies and operational procedures of the multinational corporation, including the adjustment to foreign cultures and governments. The review of the development, organization and structure of the international firm.

IB 645 Comparative International Business Environments
Prerequisite: IB 643, MK 609. A comparative approach to the study of the noneconomic aspects of foreign markets of several representative areas in the world. Focus on the interaction between the sociocultural environment of host nations and the multinational firm.

IB 651 International Marketing
Prerequisite: IB 643, MK 609. The application of marketing principles and techniques in a global environment. A managerial approach to international marketing as it pertains to product policies, market channels, pricing, advertising in a foreign market. Emphasis on marketing in different cultural settings.

IB 652 Multinational Business Management
Prerequisites: IB 643, MK 609. An examination of global strategy, ownership control, organization and resource management. Major attention given to international risk analysis.

IB 660 East and Southeast Asian Business Systems
Prerequisites: IB 643 and MG 637, or permission of the adviser for international business. An analysis of the business systems of the industrialized, newly industrialized and developing nations of East and Southeast Asia. Focus on business organization, processes, procedures and behavior. Emphasis on the historical, political and cultural underpinnings of business activity. Business strategies and negotiating techniques to be used with East and Southeast Asian governments and firms.

IB 661 Investment Strategies for Developing Countries
Prerequisites: FI 615, IB 643, MG 637 and MK 609. Examination of strategies which can be used by developing nations to attract foreign investment in the form of capital, technology, and management and marketing skills. Methods of assessing the resource potential of developing countries will be studied, including how to establish competitive advantage and how to select the most attractive country and industry targets.

IB 670 Selected Topics
A study of selected issues of particular interest to the student and instructor. May be taken more than once.

IB 690 Research Project
Prerequisite: 15 graduate hours and permission of the instructor. Independent study under the supervision of an adviser.

IB 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

IB 696 Independent Study II
A continuation of Independent Study I.

IB 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

IB 699 Thesis II
A continuation of Thesis I.

Industrial Engineering

IE 601 Introduction to Operations Research/ Management Science
Prerequisite: IE 607. Introduction to the techniques and philosophies of management science and operations research. Includes: linear programming, inventory analysis, queueing theory, dynamic programming, decision analysis and other modeling techniques.

IE 604 Management Systems
Techniques of industrial and governmental systems management including general systems and organizational theory.

IE 607 Probability Theory
Prerequisite: M 610 or equivalent. Probability of events. Random variables and expectations; discrete and continuous distributions; important standard distributions and applications; moment generating functions; central limit theorem.

IE 609 Descriptive and Inferential Statistics
Prerequisite: IE 607 or equivalent. Inferential statistical designs, including basic statistical tests and analysis of variance. Statistical theories and application of correlation analysis, multiple linear regression, nonlinear regression and analysis of covariance.

IE 612 Managerial Interactions I
An interdisciplinary systems approach to human behavior in organizations with emphasis on the impact of industrial engineering methods on organizational performance. Deals with individual motivation and face-to-face interaction in managerial roles.

IE 613 Managerial Interactions II
Prerequisite: IE 612. Continuation of IE 612. Organizational development, job enrichment and modern work attitudes.

IE 614 Data Information Systems
Prerequisites: any one of CS 603 through CS 610 or equivalent, IE 604. Introduction to automated information systems planning and operations and their impact on management decision making, control functions and communication capabilities. An overview of concepts and procedures with applications in urban environments, large organizations and governmental agencies. Techniques presented include PERT/CPM, Gantt charting, cost-benefit analysis.

IE 615 Transportation and Distribution
Prerequisite: IE 601. Introduction to transportation science with emphasis on physical distribution problems. Survey of operations research models and optimization strategies and their roles in transportation systems management.

IE 621 Linear Programming
Prerequisite: IE 601 or equivalent. Thorough coverage of the techniques and applications of linear programming. Special simplex forms and optimality conditions, duality and sensitivity are covered. Applications to network flow problems.

IE 622 Queueing Theory
Prerequisite: IE 601. Elements of queueing theory including finite and infinite cases. Single server and multiple server parallel channels/series queues and special cases are analyzed.

IE 623 Decision Analysis
Prerequisite: IE 609. Decision theory, game theory; benefit-cost analyses under uncertainty; advanced engineering economic analysis.

IE 624 Quality Analysis
Prerequisite: IE 609. Concepts of quality and statistical quality analysis. Sampling techniques and decision processes.

IE 625 Advanced Mathematical Programming
Prerequisites: CS 606B, IE 621. Advanced mathematical programming techniques. Integer programming, goal programming, and multiple objective linear programming techniques will be covered. Computer applications will be demonstrated.

IE 643 Reliability and Maintainability
Prerequisite: IE 609 or QA 604. The basic theory and methodology of reliability and maintainability, including application of discrete and continuous distributions and statistical designs. Reliability, estimation, structure models and growth models.

IE 651 Human Engineering I
An introduction to the design of machines, jobs and environments with consideration of ergonomic principles. Coverage of behavioral, anatomical, physiological and organizational factors affecting performance, comfort and safety. Laboratory fee required.

IE 652 Human Engineering II
Prerequisite: IE 651. Continuation of IE 651. In-depth analysis of selected topics in ergonomics including work physiology, anthropometry and signal detection theory. Laboratory experiments and reports included. Laboratory fee required.

IE 655 Manufacturing Analysis
Prerequisite: undergraduate courses in manufacturing or manufacturing work experience and consent of instructor. The principles of the theory of metal cutting and metal working for improving the manufacturing operations involving metal machining and metal working. An opportunity for the students to thoroughly understand the experimental approaches used in manufacturing. Laboratory fee required.

IE 671 Current Topics in Operations Research
Prerequisite: IE 601 or permission of instructor. An examination of new developments or current practices in operations research. A topic will be selected for thorough study. Possible subject areas include nonlinear programming, network theory, scheduling techniques, specialized techniques, specialized applications. Content may vary from trimester to trimester.

IE 672 Current Topics in Industrial Engineering
Prerequisite: IE 601 or permission of the instructor. An examination of new developments or current practices in industrial engineering. A topic will be selected for thorough study. Possible subject areas include reliability, production engineering, human factors, specialized applications. Content may vary from trimester to trimester.

IE 681 System Simulation
Prerequisites: IE 601; CS 606B or CS 606 and permission of the instructor. Methods of modeling and simulating man-machine systems. Thorough coverage of discrete event simulation. Random number generators and variate generations discussed. Use of a simulation package and several projects will be required.

IE 683 Systems Analysis
Prerequisites: IE 601 or QA 605, IE 614. Techniques and philosophies defining the concept of systems analysis presented in detail; illustrated with large-scale case studies. Diverse systems are analyzed covering the social, urban, industrial and military spheres. Techniques include utility theory, decision analysis and technological forecasting.

IE 685 Theory of Optimization
Prerequisites: IE 601; CS 606 or equivalent. Methods of nonlinear optimization and programming. Search methods including golden section and dichotomous; constrained and unconstrained optimization including Rosenbrocks and Fletcher-Powell algorithms. Penalty and barrier function methods.

IE 686 Inventory Analysis
Prerequisites: IE 601, IE 607 or QA 605. Inventory theory and practical applications in operating inventory systems. Model construction, optimization and computer simulation.

IE 687 Stochastic Processes
Prerequisite: IE 601. The theory and application of discrete and continuous-time stochastic processes. Areas of application include queueing, inventory, maintenance and probabilistic dynamic programming models.

IE 688 Design of Experiments
Prerequisite: IE 609 or equivalent. Principles of modern statistical experimentation and practice in use of basic designs for scientific and industrial experiments; single factor experiments, randomized blocks, Latin squares; factorial and fractional factorial experiments; surface fitting designs.

IE 690 Research Project
Prerequisite: 15 graduate hours and permission of the program coordinator. Independent study under the guidance of an adviser into an area of mutual interest, such study terminating in a technical report of academic merit. Research may constitute a survey of a technical area in industrial engineering or operations research, or may involve the solution of an actual or hypothetical technical problem.

IE 695 Independent Study I
Prerequisite: permission of the program coordinator. Independent study under the guidance of an adviser into an area designated by the program coordinator.

IE 696 Independent Study II
A continuation of Independent Study I.

IE 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

IE 699 Thesis II
A continuation of Thesis I.

IE 704 Seminar in Management and Control Systems
Enrollment limited to doctoral students only. See p. 138 for course description.

Business Law

LA 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

LA 673 Business Law I: Contracts and Sales
A study of the legal aspects of contracts and the results of contractual obligations. Legal problems stemming from the sale of goods, including the rights and duties of buyers and sellers and the remedies available to them.

LA 674 Business Law II: Business Organizations and Negotiable Instruments
Prerequisite: LA 673. Introduction to problems of formation and operation of legal groups with particular emphasis on the law of agencies, partnerships and corporations. Includes the law of negotiable instruments.

LA 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

LA 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

LA 696 Independent Study II
A continuation of Independent Study I.

LA 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

LA 699 Thesis II
A continuation of Thesis I.

Logistics

LG 660 Logistics Technology and Management
Designed to provide to the student a broad survey of the wide range of logistics activities. Subjects covered: the concepts of the integrated logistics management system, customer interfaces, inventory management and support of spares and supplies, physical distribution management as well as the logistical organization planning and administration. Includes the quantitative analytic techniques and computational tools commonly used in the logistical decision-making process.

LG 663 Logistics Management in the System Acquisition Process
Designed to provide students with a general knowledge of the management process for the acquisition of equipment and material. Includes: test and evaluations, specifications as a procurement instrument, procurement methods, types of contracts and management system interfaces.

LG 665 Integrated Logistics Support Analysis
Designed to provide students with an opportunity to understand the concept of Integrated Logistics Support (ILS) and an overview of each of the elements of logistics specialties, their interface and interaction, as well as the integration of the separate logistics specialties into a coherent effort and output. Includes: reliability, maintainability, life-cycle cost, ILS management and major ILS decisions involved, test and support equipment and personnel, and training warranties.

LG 669 Life Cycle Cost Analysis
A study of Life Cycle Cost Analysis (LCCA), a state-of-the-art management tool used in the defense industry to assist and advise decision makers in identifying a preferred choice among all possible alternatives in acquisition of new equipment and/or systems. Includes: techniques and concepts such as the total cost concept, the fixed cost criterion, the fixed effectiveness criterion and the marginal utility criterion. Management decision making emphasized.

LG 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

LG 672 Designing for Logistics Support
Overview of strategies and techniques for securing good logistics support through product design, manufacturing, inventory management, field maintenance, and customer education and training. Discussion of automation, smart systems, cost-effectiveness trade-offs and use of operations research optimization.

LG 673 Human Engineering in Logistics Support
Study of the human element in logistics and the role of human engineering in creating high performance supply, repair and replacement activities. Adverse conditions and hostile environments analyzed. User feedback, simulation and artificial intelligence in the framework of design, training and end-use performance.

LG 675 Logistics Techniques and Policy
Analysis of developing DOD policy in the field of logistics and its likely impact on both foreign and domestic defense contractors. Overview of emerging technologies and weapons systems, and of the resultant demands expected of logistics support. Discussion of warranty concepts, life-cycle considerations and future economic implications.

LG 676 Logistics Products
Description of logistics products and systems in the context of deliverable documents, databases, data acquisition, software and skilled manpower. Study of the logistics management function in defense-related organizations and the consequences of a growing logistics emphasis, including organizational design to meet customer needs and government regulations.

LG 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

LG 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

LG 696 Independent Study II
A continuation of Independent Study I.

LG 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

LG 699 Thesis II
A continuation of Thesis I.

Mathematics

M 610 Fundamentals of Calculus
Prerequisite: M 115 (pre-calculus mathematics) or equivalent. Review of algebra and trigonometric functions. Topics from calculus, including differentiation and integration methods applied to problems in science, business and the social sciences. A review of series.

M 615 Linear Mathematics and Combinatorics
Prerequisite: M 610 or equivalent. Discrete mathematics topics used extensively in computer science, including linear algebra, graph theory and combinatorics. Emphasis on applications to computer science.

M 616 Applied Modern Algebra for Computer Science
Prerequisite: M 615. Advanced topics in logic and combinatorics as well as an introduction to discrete modern algebra and its applications to computer science.

M 620 Numerical Analysis
Prerequisites: a minimum of 12 credit hours of undergraduate mathematics, including calculus and linear algebra; knowledge of a computer programming language such as Pascal, FORTRAN or BASIC. Topics include: solution of transcendental equations by iterative methods; solution of systems of linear equations (matrix inversion, etc.); interpolation, numerical differentiation and integration; solution of ordinary differential equations.

M 624 Applied Mathematics
Prerequisite: a minimum of 12 credit hours of undergraduate mathematics, including calculus and differential equations. Special functions; Fourier series and integrals; integral transforms (Fourier, Laplace, etc.) and their use in solution of boundary value problems.

M 632 Methods of Complex Analysis
Prerequisite: graduate standing in engineering or mathematics. A study of the applications of the methods of complex variables to engineering and physical sciences. Includes: analytic function theory, contour integration and conformal mapping.

M 670 Selected Topics
Prerequisite: permission of the instructor. A study of selected topics of particular interest to the students and instructor. May be taken more than once.

M 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

M 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

M 696 Independent Study II
A continuation of Independent Study I.

M 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

M 699 Thesis II
A continuation of Thesis I.

Mechanical Engineering

ME 602 Mechanical Engineering Analysis
Topics in vector calculus and complex variables. Solution of partial and differential equations as applied to mechanical engineering.

ME 604 Numerical Techniques in Mechanical Engineering
Prerequisite: knowledge of FORTRAN. Review of matrix algebra and simultaneous equations. Numerical integration and differentiation, including techniques such as Euler, Runge-Kutta, Milne, shooting, Crank-Nicolson and FEM. Emphasis on numerical solutions to ordinary and partial differential equations relevant to mechanical engineering.

ME 605 Finite Element Methods in Engineering
Prerequisite: ME 604 or M 620. Basic concepts underlying the FEM. Displacement and weighted residual formulations of the finite element approach to numerical solutions. Applications to one- and two-dimensional problems in areas such as elasticity, heat transfer and fluid mechanics.

ME 610 Advanced Dynamics
Kinematics and dynamics of single particles and systems of particles. Lagrange's equations. Hamilton's principle and canonical transformation theory. The inertia tensor and rigid body motion.

ME 611 System Vibrations
Advanced techniques for analysis of vibrations in mechanical systems. Multiple degrees of freedom, random noise inputs among topics covered.

ME 612 Random Vibrations
Prerequisite: ME 602 or consent of the instructor. Review of the theory of stochastic processes. Stationary and nonstationary stochastic excitations. Random vibrations of single degree-of-freedom systems. Response of multiple degree-of-freedom systems to random loads. Random vibrations of continuous systems. Nonlinear system analysis. Method of averaging and multiscales. Introduction to nonlinear random vibrations. Method of Fokker-Planck equation. Perturbation, equivalent linearization, stochastic averaging and other approximate techniques. Applications to mechanical, civil and earthquake engineering problems.

ME 613 Fundamentals of Acoustics
Basic theory of acoustics in stationary media; plane, cylindrical and spherical waves; reflection, transmission and absorption characteristics; sources of sound; propagation and attenuation in ducts and enclosures.

ME 615 Theory of Elasticity
Index notation; Cartesian tensors and coordinate transformation; stress tensor and field equation; analysis of stress and strain in two and three dimensions; Airy stress function; applications to problems of torsion and bending; experimental methods.

ME 620 Classical Thermodynamics
Phenomenological equilibrium and nonequilibrium thermodynamics. Formulation and application of fundamental laws and concepts; chemical thermodynamics.

ME 625 Mechanics of Continua
Tensor analysis, stress vector and stress tensor, kinematics of deformation, material derivative, fundamental laws of continuum mechanics, conservation theorems, constitutive laws and representative applications.

ME 630 Advanced Fluid Mechanics
Advanced topics from among the following areas: perfect fluids, viscous fluids, turbulence, boundary layer theory, surface phenomena, shock waves and gas dynamics.

ME 632 Advanced Heat Transfer
Review of the basic concepts of conduction and radiation. Detailed treatment of laminar, turbulent, free and forced convectional flows. Computer projects.

ME 635 Dynamic Systems and Control
Introduction to the modeling of dynamic systems. Emphasis on the analysis of first and higher order continuous-time linear models. Feedback techniques with examples from various branches of mechanical engineering.

ME 638 Measurement and Instrumentation in Mechanical Engineering
Measurement principles, including error analysis. Instrument systems: sensing, transmitting and terminating devices. Typical systems and devices for measuring motion, force, stress, strain, pressure, flow and temperature.

ME 645 Computational Fluid Dynamics and Heat Transfer
Prerequisite: ME 630; ME 604 or M 620. Current methods of computer solutions of the conservation equations of fluid dynamics. Viscous, incompressible, compressible and shock flows. Real gas equations of state. Computer projects.

ME 670 Selected Topics
Prerequisite: permission of the instructor. A study of selected topics of particular interest to the students and instructor. May be taken more than once.

ME 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

ME 696 Independent Study II
A continuation of Independent Study I.

ME 698 Thesis I
Prerequisite: 18 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

ME 699 Thesis II
A continuation of Thesis I.

Management

MG 625 Systems Techniques in Business Administration
An integrated study of the techniques for solving administrative problems, including the analysis and improvement of organizational structures, office procedures, forms design, records management, reports and equipment standards. The conduct of a comprehensive systems survey using these techniques explored in depth, as are flow charting and the preparation of manuals.

MG 637 Management
A study of the functions of management: planning, organizing, directing, controlling, coordinating.

MG 638 Cost Benefit Management
Prerequisites: EC 603, QA 604. An introduction to and overview of the field of cost/benefit management. Fundamental theoretical evaluation of cost/benefit of a project. Includes: the selection of the best investment criteria, the external environmental spillover effects and the application of cost/benefit management in decision making under uncertainty.

MG 640 Management of Health Care Organizations
Identification of the characteristics of health care organizations and the dimensions of management in such organizations. Examination and application of the principles of management necessary for the successful operation of health care organizations. M.B.A. students in the health care concentration take MG 640 in place of MG 637 in the required core curriculum.

MG 645 Management of Human Resources
A study of organizational practices in the management of human resources. Manpower planning, recruitment, selection, training, compensation and contemporary problems of the field.

MG 650 Entrepreneurship
Prerequisites: A 621, FI 615, MG 637, MK 609, or permission of the instructor. Deals with the establishment of a new business venture, covering such topics as site development, market analysis, staffing, inventory control, personnel relations and funding.

MG 655 Advanced Business Strategy
Prerequisites: FI 615, MG 637. An analysis of corporate combinations and their effects on management, labor, consumers and the economy. Specific topics include the economic and financial setting of business combinations; the motives for merger; merger valuation; merger negotiations, the integration of merged units with the balance of corporate activities; divestitures and spinoffs.

MG 660 Comparative Management
Prerequisite: MG 637. A study and comparison of managerial systems and practices in different organizations and/or countries throughout the world. A conceptual framework is developed to analyze the interaction between managerial processes and cultural factors as they affect business activity.

MG 661 Development of Management Thought

Prerequisite: MG 637. Study of the literature from various disciplines in order to determine the thinking and practices of leaders of organizations, past and present. The historical perspective of management thought. The contributions of religion, philosophy, economics, sociology and psychology to management thought and practice. Emphasis on pioneering works in the management of organizations. Case studies of the thinking and practices of famous leaders of American business enterprises.

MG 662 Organization Theory

Prerequisite: MG 637. A survey of the literature on theories of organization with emphasis on contemporary theories. Application of the theories to management and organizational problems will be attempted. Difficulties arising between theory and practice will be examined.

MG 663 Leadership in Organizations

Prerequisite: MG 637. Examination of theories and research findings from the behavioral sciences that are relevant to leadership in organizations. The role of the leader within the organization; the prerequisites, knowledge and practices required for successful leadership. Programs for the development of leaders explored.

MG 664 Organizational Effectiveness

Prerequisite: MG 637. Identification of the criteria necessary for developing and maintaining effective organizations. A study of the concepts that may be utilized in the management of these criteria. Approaches that may be examined and applied to problem situations through cases and role playing.

MG 665 Compensation Administration

Prerequisites: EC 625 andMG 645. A study of the compensation function in organizations. Establishing wages and salaries, fringe benefits and incentives.

MG 669 Advanced Business Policy

Prerequisites: MG 637 and three additional graduate credits in management. Examination of management policies and strategies for the complex organization operating in a dynamic environment, from the viewpoint of the top level executives of the organization. Develops analytic frameworks for the management of numerous elements involved in assuring the fulfillment of the goals of the total organization. Integrates the student's general business knowledge with the required courses in the M.B.A. program. Emphasis is placed on the development of oral and written skills by the examination and discussion of cases.

MG 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

MG 678 Personnel Management Seminar

Prerequisites: EC 625, MG 637, MG 645 and P 619. A seminar in the personnel and manpower management function of the modern work organization. The use of an integrated behavioral, quantitative and systems approach permits an applied multidisciplinary synthesis of the various aggregate manpower management subsystems required in the modern work organization.

MG 679 Industrial Relations Seminar

Prerequisites: EC 625, EC 687, MG 637 and P 619. A seminar in industrial relations and the labor-management relations function of the modern work organization. The use of an integrated behavioral, economic and legal approach permits an applied multidisciplinary synthesis of the employee relations function required in either nonunionized or unionized work organizations.

MG 680 Current Topics in Business Administration

Prerequisite: 15 graduate hours or permission of the instructor. An integrative course examining the role of business in society and relating the business firm to its social, political, legal and economic environments. While the exact content of this seminar is expected to vary from trimester to trimester in accordance with the varied academic interests and professional backgrounds of different faculty handling the course, the basic theme is the role of the business firm as the "keeper" of the market mechanism and the means for organizing resources in the economy.

MG 685 Research Methods in Business Administration
Prerequisite: At least 24 graduate hours including QA 604 or equivalent. Designed to familiarize administrators with methods of business and social research and to assist them in the presentation, interpretation and application of research data.

MG 690 Research Project
Prerequisite: all other courses in the required core curriculum of the master's degree program including MG 685. All students will complete an independent research study and participate in an integrative seminar.

MG 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

MG 696 Independent Study II
A continuation of Independent Study I.

MG 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussion of the individual student's progress in the preparation of a thesis.

MG 699 Thesis II
A continuation of Thesis I.

MG 701 Research Design I
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 702 Research Design II
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 737 Seminar in Management
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 738 Policy and Strategic Decision Making
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 801 Dissertation I
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 802 Dissertation II
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 803 Dissertation III
Enrollment limited to doctoral students only. See p. 138 for course description.

MG 804 Dissertation IV
Enrollment limited to doctoral students only. See p. 138 for course description.

Marketing

MK 609 Marketing
Prerequisite: EC 603. An intensive study of modern marketing fundamentals; a study of the decision-making problems encountered by the marketing executive and the relation of marketing to environmental forces.

MK 616 Buyer Behavior
Prerequisite: MK 609. An examination of the principal comprehensive household and organizational buyer behavior models and the behavioral science theories on which such applied models are based. Analysis of the buyer at the individual level, at the social level and at the organizational level.

MK 621 Marketing Financial Services
Prerequisites: FI 615, MK 609. An intensive study of the modern marketing fundamentals and how they apply to the financial services industry. Special attention on the insurance, banking and securities industries.

MK 638 Competitive Marketing Strategy
Prerequisites: MK 609 plus three additional credits in marketing or MG 669. Focuses on product, price distribution and promotion strategies that will give a company a competitive advantage. Also, corporate self-appraisal, market segmentation and competitor evaluation.

MK 639 Marketing Research and Information Systems
Prerequisites: MK 609, QA 604. A managerial approach to marketing information flow, including recognition of information needs and an overview of marketing research as part of an information system. Special attention to evaluation of research design and measurement methods, effective utilization of research output and problems encountered in establishing a marketing information system.

MK 641 Marketing Management
Prerequisite: MK 609. The treatment of the basic decision problems of marketing management in terms of a conceptual framework for analysis. Consideration of the role played by human judgments and the mathematical tools available to aid in these judgments in a number of marketing areas, notably market analysis, pricing decisions, advertising decisions, promotional decisions and selection of distribution channels.

MK 643 Product Management
Prerequisite: MK 609. The search for new product ideas and their evaluation; the organization structure necessary to the development and introduction of new products and the management of a product line; the commercial aspects of product design, packaging, labeling and branding; considerations involved in making product deletion decisions; and the social and economic effects of managing product innovation.

MK 645 Distribution Strategy
Prerequisite: MK 609. Analysis of channel strategies, theory and economic justification of distribution channels, direct and indirect methods of control, behavioral states of channel members, costing the channel and management of changes in distribution.

MK 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

MK 680 Marketing Workshop
Centers around a structural model of a business firm. The major objective is to provide the student with an opportunity to develop managerial insights and skills in dealing with marketing problems in a competitive environment. Participants are grouped into decision-making units (companies) and each student assumes the role of a marketing executive operating a business firm. These executives will be responsible for planning, organizing, staffing, directing and controlling their firm's resources.

MK 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

MK 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

MK 696 Independent Study II
A continuation of Independent Study I.

MK 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

MK 699 Thesis II
A continuation of Thesis I.

MK 701 Seminar in Strategic Marketing
Enrollment limited to doctoral students only. See p. 138 for course description.

Psychology

P 605 Survey of Community Psychology
An examination of historical roots and current concepts. A social-problems approach to psychological dysfunction. Changing professional roles. Community organization and human service delivery; strategies of intervention and community change.

P 607 Special Problems in Community Psychology
Theory and practice of community psychology with selected problems, populations and settings. Emphasis on community psychology service issues and problems in the Connecticut area.

P 608 Psychometrics and Statistics
Prerequisite: intermediate undergraduate course in statistics. Comprehensive introduction to fundamental conceptual and technical aspects of measurement and psychological description of individuals. In-depth treatment of statistical issues such as advanced correlation and regression techniques using SPSSx statistical software to enhance understanding of key concepts. Emphasis on application of measurement and statistics to psychological assessment in field settings.

P 609 Research Methods
Prerequisite: undergraduate course in statistical methods. Introduction to analytic concepts pertinent to sampling techniques, research design, variable control and criterion definition. Basic problems of measurement, research paradigms, sources of error in research interpretation, problems of variable identification and control, and consideration of the logic of inference.

P 610 Program Evaluation

Prerequisite: P 609. A systematic study of the processes involved in planning, implementing and evaluating organizational programs. Focus on action research strategies which integrate the entire process from planning to evaluation of the program.

Practicum Seminars and Fieldwork (P 611-P 616):

An apprenticeship or on-the-job role in an ongoing program or center. Emphasis on developing conceptualizations and insights as a result of involvement in the apprenticeship. Placement at a field site for eight to 10 hours per week. Weekly class meetings serve two purposes: to present specific theoretical material and research findings appropriate to each seminar and to allow students to discuss their field training experiences. A comprehensive project report is required in which each student will analyze and integrate fieldwork experience with relevant research and coursework.

P 611 Individual Intervention Seminar

An examination of strategies for providing direct helping services to individuals in the context of formal and informal networks of social and community support. Includes: the nature of the dyadic relationship, development of therapeutic and case management skills, professional ethics and supervision. Applications to a wide range of problems, populations and settings.

P 612 Consultation Seminar

An examination of the consultation process. Includes: the role of the consultant, stages of consultation, the development of consulting skills and political/ethical issues. Different approaches to consultation practice are analyzed, along with their associated interventions.

P 613 Systems Intervention Seminar

An examination of the dynamics of planned, system-level change in the field of human services. The distinctive characteristics of human service organizations are analyzed; and an overall intervention model is developed, applied and discussed. Of special interest to those with responsibilities in program planning and implementation.

P 614 Individual Intervention Fieldwork

Supervised field training in the provision of direct services to individual clients. Supervision is jointly provided by the field setting and the psychology department. Students must be available for at least one day per week. Permission of instructor is required.

P 615 Consultation Fieldwork

Supervised field training in the development of consultation skills. Supervision is jointly provided by the field setting and the psychology department. Students must be available for at least one day per week. Permission of instructor is required.

P 616 Systems Intervention Fieldwork

Supervised field training in program planning and development. Supervision is jointly provided by the field setting and the psychology department. Students must be available for at least one day per week. Permission of instructor is required.

P 619 Organizational Behavior

Analysis of various theories of business and managerial behavior emphasizing the business organization and its internal processes. Psychological factors in business and industry, including motivation, incentives and conflict. A study of research findings relevant to an understanding and prediction of human behavior in organizations.

P 620 Industrial Psychology

Psychological theories and research applied to business and other organizations. Problems and methods in selection and placement, training, performance appraisal, criterion development and ergonomics.

P 621 Behavior Modification I: Principles, Theories and Applications

Theory and research in behavior modification. Aversive learning, desensitization, operant conditioning. Applications in clinical and nonclinical settings.

P 622 Behavior Modification II: Advanced Theory, Assessment and Application in Mental Retardation Settings

Prerequisites: P 621 and P637. Behavior modification and behavioral assessment applied to the mentally retarded. Use of token economies, cognitive behavior modification, problems involved in the use of aversive techniques, advanced assessment techniques.

P 623 Psychology of the Small Group

Analyses of the behavior and interaction of people in mutual gratification groups, committees, work groups and clubs.

P 624 Experiential Self-Analytic Group

This experiential group develops understanding of group and interpersonal dynamics through analysis of ongoing interaction and improves participants' interpersonal abilities relevant to organizational consulting and diagnosis. Written permission to register for this course must be obtained directly from the program coordinator and/or instructor.

P 625 Life Span Developmental Psychology

In-depth exploration of normal and abnormal development through the life cycle. Emphasis on childhood, adolescence, adulthood and later years. Developmental impact of family, neighborhood, schooling, work, culture. Issues of class, ethnicity, gender, age, etc. Applications of theory and research to community treatment and prevention.

P 627 Attitude and Opinion Measurement

Prerequisite: P 609. Examination of modern methods of attitude and opinion measurement. Scale, schedule and interview formats. Respondent sets. Consideration of sampling problems.

P 628 The Interview

The interview as a tool for information gathering, diagnoses, mutual decision making and behavior change. Use of role playing provides the student with insights into nuances of interpersonal relationships. Applications to selection, counseling and other situations.

P 629 Introduction to Psychotherapy and Counseling

Theory, research and practice of psychotherapy and counseling. Examination of the assumptions, roles and processes of the therapeutic relationship.

P 632 Group Dynamics and Group Treatment

An exploration of the emerging area of group dynamics. The structure of groups and their development, process interaction analysis, formal and informal groups, group psychotherapy and sensitivity training.

P 634 Personality Assessment

A critical survey of the theories and issues of personality assessment. Includes: intelligence, achievement and ability assessment. Personality tests and ethical questions associated with psychological testing.

P 635 Assessment of Human Performance with Standardized Tests

Prerequisite: P 609. Theories, assumptions and constraints underlying construction and application of standardized tests employed in clinical, educational, governmental and industrial settings. Emphasis on selection of appropriate standardized tests for specific applications.

P 636 Abnormal Psychology

Etiological factors in psychopathology dynamics and classification of neuroses, psychophysiologic conditions, psychoses, personality disorders, organic illness, retardation and childhood diseases.

P 637 Mental Retardation: History, Theory and Practice

Definition of mental retardation, criteria for legal diagnosis, classification systems, causes of retardation and syndrome descriptions. Structure of the care and management system in Connecticut, the philosophy governing the system, detailed description of the system and of how it is financed.

P 638 Psychology of Communication and Opinion Change

Characteristics of the source, the situation and the content of messages, along with other variables influencing attitudinal modification. Cognitive factors and social settings in attitude change.

P 640 Industrial Motivation and Morale

Prerequisite: P 619. The meaning of work, theories of motivation, values and expectations, performance and reinforcement, job satisfaction and motivation, pay as an incentive, interventions to increase work motivation.

P 641 Personnel Development and Training

Prerequisite: P 619 or P 620. Identification of skills and developmental needs, both from an organizational and individual perspective. Techniques for assessment and development of skills, especially at the managerial level. Training approaches. Evaluation of training efforts.

P 642 Organizational Change and Development

Prerequisite: P 619. The nature of organization development, intervention by third-party consultation, change in organization structure and role relationships, evaluation of change efforts, participation, conformity and deviation.

P 643 The Psychology of Conflict Management

The constructive management of conflict at the individual, corporate and multicultural levels. Theories on the etiology of conflict as well as various conflict resolution models. The role of communication and perspective-taking in the constructive resolution of conflict. Students will learn how to manage more constructively their own personal conflicts as well as conflicts occurring at the corporate and multicultural levels.

P 644 Performance Measurement

Prerequisite: P 620. Theory and applications associated with performance appraisal systems in organizations. Emphasis is on the development and implementation of valid appraisal systems.

P 645 Seminar in Industrial/ Organizational Psychology

Prerequisites: P 609 and P 619. An examination of the professional psychologist at work in organizations. Regular subjects include: measurement methods, prediction, validation, selection, training and employee assistance programs, group dynamics, organizational change, stress, performance appraisal. Practitioners in business, industry, research organizations and government will provide insights into the application of psychological principles and methods.

P 651 Organizational Behavior Modification

The application of behavior modification techniques such as reinforcement, punishment, extinction, modeling and assertiveness training to organizational behavior management. Applications include training, stress management, productivity improvement, sales, waste and error control, absenteeism and safety.

P 660 Contemporary Issues in Industrial/Organizational Psychology

Prerequisite: 12 hours in psychology or consent of the instructor. In-depth investigation of topical areas of concern in industrial/organizational psychology. Topics may include, but are not limited to, the impact of EEOC regulations on selection and promotion; assessment centers; the role of the consultant in organizations; flextime, day care and other strategies to accommodate family needs of employees; stress in work settings; women in management. Content will be stated at the time the course is scheduled. Students may petition for a particular topic they feel would fit their academic goals. May be taken twice.

P 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

P 678 Practicum I

For students already employed in a managerial or supervisory role. A job-related research project is carried out under faculty supervision.

P 679 Practicum II

A continuation of Practicum I.

P 693 Organizational Internship I

For students without experience at the managerial or supervisory level. Under faculty supervision, the student engages in field experience in an industrial setting and produces a comprehensive project report analyzing the internship experience.

P 694 Organizational Internship II

A continuation of Organizational Internship I.

P 695 Individual Intensive Study I

Prerequisite: completion of required courses or 24 graduate hours and written approval of department chairperson. Provides the graduate student with the opportunity to delve more deeply into a particular area of study under faculty supervision.

P 696 Individual Intensive Study II

A continuation of Individual Intensive Study I.

P 698 Thesis I
Prerequisite: completion of all required courses or 24 graduate hours and written approval of department chairman. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

P 699 Thesis II
A continuation of Thesis I.

P 719 Seminar in Human Resources
Enrollment limited to doctoral students only. See p. 138 for course description.

Public Administration

PA 601 Principles of Public Administration
The development, organization, functions and problems of national, state and local governmental administration.

PA 602 Public Policy Formulation and Implementation
The relationship between public administration and the formulation of public policy is studied. The implementation of public policy by administrators based on the politics of the administrator is examined in terms of interaction between various group representatives such as legislators, politicians, and pressure-group leaders.

PA 604 Communities and Social Change
Interactions among the community as a social organization and education, police and welfare institutions within it; special attention to conceptual frameworks and current research or action programs that particularly affect minority groups.

PA 611 Research Methods in Public Administration
Prerequisite: QA 600 or equivalent. Designed to familiarize administrators with the tools and potentialities of social research, and to assist them in the presentation, interpretation and application of research data.

PA 620 Personnel Administration and Collective Bargaining in the Public Sector
Study of the civil service systems in the United States and the state governments, including a systematic review of the methods of recruitment, promotion, discipline, control and removal. Explores the effects on work relationships of collective bargaining statutes which have been adopted by legislatures. Emphasis is placed on collective bargaining case studies from state and local governments and hospitals.

PA 625 Administrative Behavior
Recommended prerequisite: PA 601. The problems faced by an administrator in dealing with interpersonal relationships and human processes. Analysis of individual and group behavior in various governmental and business settings to determine the administrative action for the promotion of desired work performance. Emphasis given to the public sector. Participation in actual problem situation discussions and case studies.

PA 630 Fiscal Management for Local Government
Recommended prerequisite: PA 601. The problems faced by a survey of the essential principles of governmental accounting, budgeting, cost accounting and financial reporting. The various operating funds, bonded debt, fixed assets, investments, classification of revenue and expenditures, general property taxes and interfund relationships.

PA 632 Public Finance and Budgeting
Recommended prerequisite: PA 601. State and local expenditure patterns, state and local revenue sources, income taxation at the state and local levels, excise taxation, sales taxation, taxation of capital and the property tax. Emphasis on fiscal and economic aspects of federalism and federal state fiscal coordination. The role of the budget in the determination of policy, in administrative integration, in control of government operations.

PA 641 Financial Management of Health Care Organizations
Theory and application of financial planning and management techniques in health care organizations. Emphasis on financial decision making and on preparation of short-term and long-term cash, capital, revenue and expense budgets and financial plans to meet the requirements of HCFA and other third parties.

PA 642 Health Care Delivery Systems
A contemporary analysis of health care delivery systems in the U.S. Financial, cost, economic, political and organizational issues will be discussed.

PA 643 Health and Institutional Planning

Designed to develop skills and understanding of the dynamics of health and social planning processes with respect to consumer demand, national and local health goals and the optimal location of facilities, services and manpower.

PA 644 Administration of Programs and Services for the Aged

The structure, function and properties of publicly and privately funded programs and service organizations providing health services to the aged. The economic, political, legal and social issues which affect the administration of human service organizations will be studied, with emphasis on administration of health care services.

PA 645 Health Care Economics and Finance

Recommended prerequisite: PA 641. Integration of accounting, economics, finance, budgeting and health insurance principles, concepts and analytic tools which are essential to the decision-making processes of health care organizations.

PA 646 Organization and Management of Long-Term Care Facilities

Examines the variety of systems providing long-term care services for the aged. Special concentration on the ways various facilities are managed and on the impact of state bylaws. Case studies illustrate decision making and problem solving within health institutions.

PA 647 Alternative Health Care Delivery Systems

A survey of nontraditional approaches to health care. Includes: cost shifting, cost sharing, the development of outpatient facilities and the impact of cost containment regulation in a systems-oriented framework.

PA 648 Contemporary Issues in Health Care

Gives health care professionals a broad view of current topics in their field. The students will view current videotapes, work on case studies, participate in class exercises and present several reports. Current articles illustrate the issues under discussion.

PA 650 Administrative Law

A search for principles and criteria against which public interest can be balanced with private right in the changing patterns of government, with particular reference to the American system.

PA 660 Urban Planning: Theory and Practice

Explores the concept of physical planning within the urban developmental framework. The function of planning in its relationship to the environment. Comprehensive planning with its many ramifications involving the various sections of our society. Methods for analyzing problems as well as design methods for problem solving.

PA 661 Problems of Metropolitan Areas

Analysis of the problems of government and administration arising from the population patterns and physical and social structures of contemporary metropolitan communities.

PA 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

PA 680 Seminar in Public Administration

Exact material to be covered will be announced.

PA 681 Long-Term Health Care Internship I

Prerequisites: PA 641, PA 646. First of two state-required internships required to be eligible to take the State of Connecticut licensing examination in long-term care administration. Course is composed of a 450-hour nursing home internship.

PA 682 Long-Term Health Care Internship II

A continuation of Long-Term Health Care Internship I.

PA 690 Research Seminar

Recommended prerequisite: PA 611. Requirements include a major independent research study and participation in an integrative seminar on research and its uses in public administration.

PA 691 Research Project

Prerequisites: 15 graduate hours and permission of the public administration graduate program coordinator. Independent study for advanced graduate students on selected problems in public administration. May be taken more than once.

PA 692 Readings in Public Administration

Prerequisite: 15 graduate hours or permission of the instructor.

PA 693 Public Administration Internship

Prerequisites: 15 graduate hours and permission of the public administration graduate program coordinator. A supervised work experience in a cooperating public service agency. Students must be available for at least one day per week.

PA 695 Independent Study I

A planned program of individual study under the supervision of a member of the faculty.

PA 696 Independent Study II

A continuation of Independent Study I.

PA 698 Thesis I

Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

PA 699 Thesis II

A continuation of Thesis I.

Physics

PH 670 Selected Topics—Physics

Prerequisite: permission of the instructor. A study of selected topics of particular interest to students and instructor. Course may be taken more than once.

Philosophy

PL 601 Business Ethics

Problems include the nature of the corporation, the values of business activity, corporate social responsibility, the proper relationship between the corporation and government, employee rights and related matters. Problems are analyzed using the most important current theories of social and economic justice.

Political Science

PS 601 Constitutional Law

A study of the judicial process and its relation to the Constitution and the political system in the United States. Examines the role of the Supreme Court in shaping judicial review, federalism, civil rights and liberties, equal protection and due process.

PS 602 Civil Liberties and Rights

An analysis of civil liberties, civil rights, due process and equal protection of the law. An examination of the role of the public official in the protection, denial or abridgment of the constitutional and legal rights of individuals.

PS 603 International Law

A study of the role of international law in the modern state system with particular reference to individuals; territorial jurisdiction; law of the sea, air and space; and the development of law through international organizations.

PS 604 Human Rights and the Law

An examination of the development of the international and national laws establishing human rights, the laws of war, war/criminality, crimes against humanity and the application of the universal declaration of human rights, of the Helsinki Accords, and of the concept of the individual as the basis of law.

PS 605 Criminal Law

Scope, purpose, definition and classification of criminal law. Offense against the person; habitation and occupancy. Offenses against property and other offenses. Special defenses. Emphasis on the Connecticut penal code.

PS 606 Advanced International Relations

Basic elements of international life relevant to the growth of a stable and peaceful global political-economic system. Includes: power, diplomacy, law, trade, aid, monetary affairs, multinational corporations and differing geographical and cultural characteristics.

PS 608 The Legislative Process

An analysis of the legislative process in the American political system. Stress on legislative politics in state and local government. Includes: legislative functions, selection and recruitment of legislative candidates, legislative role orientations, the legislative socialization process, the committee system, the legislators and their constituencies, legislative lobbyists, legislative decision making, legislative-executive relations and legislative organization and procedures.

PS 610 Legal Methods I
A study of procedure and process of the law as it applies in the American system and an introduction to legal research and writing.

PS 612 Contracts, Torts and the Practice of Law
An introduction to the most important components of private law, that is, contracts, torts and civil procedure and their application to business, government and individuals.

PS 615 Jurisprudence
The general philosophical framework for the law. Includes the background and development of the common law, sources of the law and the court system. Special problems in Anglo-American jurisprudence are reviewed.

PS 616 Urban Government
An examination of the urban political system. Stress on the political aspects of urban government structures. Includes: formal and informal decision making in urban government, community power structures, types of urban government structures, the politics of intergovernmental relations and the politics of servicing the urban environment (social services, planning agencies, education, housing, transportation, health, pollution control and ecology, revenue sharing, public safety, neighborhood corporations, etc.).

PS 617 Law, Science and Ethics
The intersection of law, science and ethics in a variety of contexts, including experimentation with human subjects, psychosurgery, genetic engineering, organ transplants, abortion and the right to die.

PS 619 Legal Protection of Computer Software
Prerequisite: CS 602 or equivalent. The legal principles involved in the protection of proprietary computer software and hardware by means of patents, copyrights and trade secrets. Consideration of software licensing and employer-employee relationships involving creative work. (See also CS 619.)

PS 625 Transnational Legal Structures
An introduction to the basic structure of legal systems in other countries, their relationship to Anglo-American law and their contextual development. Special topics include: legal status of foreign and multinational corporations, rights and responsibilities of aliens, protections for investors, expropriation and procedural due process.

PS 626 Decision Making in the Political Process
An in-depth study of decision making in the American system with special emphasis on the various types of mechanisms: executive, legislative, judicial, bureaucratic, organizational and military. The influence of intelligence, economic and psychological factors and social pressure on decisions and decision makers will be examined.

PS 628 Change and Government
A study of the major processes of change and their consequences for the functioning of government. Concentrates on changes that may occur through violence, evolution or technology and which may alter the effective operation of government.

PS 633 The Political Process and the Aged
A study of the political process as it relates to the aged. Governmental decision making on federal, state and local levels including legislation and its implications.

PS 635 Law and Public Health
A course for the civil servant or health professional concerned with the laws relating to the public health at the federal, state and local level as well as the practical administration of those laws.

PS 640 Law and Education
An examination of the legal and educational issues arising from factors such as EEO, students' rights, student financing and the relationships between schools and government.

PS 641 The Politics of the World Economy
An examination of the global politico-economic system and the challenges facing world diplomacy. Multinational corporations and political structures designed to coordinate global policies for the monetary and trade systems, international organizations and their impact on Third World development and problems facing industrialized nations analyzed.

PS 645 Government and the Industrial Sector
The various impacts of government regulation on the corporate sector and the major legal and regulatory requirements affecting business and industry.

PS 655 Conflict Resolution
Essential features and methods available within the legal system to resolve disputes, including the uses of law, equity, administrative agencies, bureaucracies, arbitration, mediation, special commissions and private self-help. Applicability of those methods to various types of disputes and the choice of law in instances when no single rule may govern in a federal system.

PS 670 Selected Topics
A study of items of special interest may include: First Amendment problems, energy and the law, law and the environment, labor legislation and the law, law and commercial paper and stock issues. May be taken more than once.

PS 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

PS 696 Independent Study II
A continuation of Independent Study I.

Quantitative Analysis

QA 600 Quantitative Analysis
Basic mathematics for solving economic and business problems. Includes: algebra review, equations and inequalities, graphs, exponential and logarithmic functions, an introduction to matrix algebra. No credit.

QA 604 Probability and Statistics
Prerequisite: QA 600 or equivalent. An introduction to business statistics. Includes: data analysis and presentation; frequency distributions; probability theory; probability distributions, decision making under uncertainty; sampling and statistical inference; hypothesis testing; t, chi-square and F tests; introduction to regression, correlation and analysis of variance.

QA 605 Advanced Statistics
A continuation of QA 604. Includes: simple regression and correlation, multiple regression, analysis of variance, the general linear model and an introduction to time series analysis and forecasting techniques.

QA 606 Advanced Management Science
Prerequisites: IE 601, QA 604, QA 605. An examination, from a management viewpoint, of the scope of applicability of the methods and models developed in IE 601 Introduction to Operations Research/Management Science, QA 604 Probability and Statistics, and QA 605 Advanced Statistics. Includes: parametric programming and economic interpretation of the dual LP problem, marginal costs and revenues, shadow prices, opportunity costs, incremental costs, costs of deviation from optimal solution point(s) and location or construction of desirable alternate optimal solutions.

QA 607 Forecasting
Prerequisite: QA 605 or permission of the instructor. A wide range of forecasting methods useful to students and practitioners of management, economics and other disciplines requiring forecasting. Focus on quantitative techniques of forecasting and will include smoothing and decomposition approaches, multiple regression and econometric models, and autoregressive/moving average methods including generalized adaptive filtering and Box-Jenkins methodology.

QA 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. Courses may cover decision science methods such as experimental design, nonparametrics, data analysis with SPSS, Bayesian decision theory and simulation. May be taken more than once.

QA 690 Research Project
Prerequisite: 15 graduate hours or permission of the instructor. Independent study under the supervision of an adviser.

QA 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

QA 696 Independent Study II
A continuation of Independent Study I.

QA 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

QA 699 Thesis II
A continuation of Thesis I.

Occupational Safety and Health Management

SH 602 Safety Organization and Administration

Intensive study of the occupational safety and health field as it currently exists. History and growth of industrial safety. Motivational and psychological aspects of accident prevention. Legal aspects of safety, including worker compensation and state and federal regulations. Engineering needs. Development of voluntary standard systems. Fire prevention, industrial hygiene and future directions.

SH 605 Industrial Safety Engineering

An analysis of the major physical hazards in industrial work and the attendant safety practices employed to eliminate the hazardous condition or minimize the likelihood and extent of injury. Includes the hazards associated with machinery, combustion, electricity, material handling and fire.

SH 608 Industrial Hygiene Practices

Prerequisite: introductory chemistry. Recognition of the magnitude and extent of the health hazards characteristic of industrial work. An evaluation of the danger, the control of the hazard and the protection of the worker.

SH 611 OSH Research Methods and Techniques

The students and OSH faculty will meet once a week throughout the trimester. The student will select a topic directly related to occupational safety and health, conduct a literature search, do a research project and prepare and defend a mini-thesis.

SH 615 Toxicology

Prerequisite: introductory chemistry. Introduction to environmental and industrial toxicology; toxicologic evaluation; the mode of entry, absorption and distribution of toxicants; the metabolism and excretion of toxic substances; interactions between substances in toxicology; toxicologic data extrapolation; particulates; solvents and metals; agricultural chemicals—insecticides and pesticides; toxicology of plastics; gases; food additives; plant and animal toxins; carcinogens, mutagens and teratogens. (See also EN 615.)

SH 620 Occupational Safety and Health Law

A survey of the major federal occupational safety and health laws with an emphasis on the Occupational Safety and Health Act of 1970 as well as state workers' compensation laws. Studies focus on the administration of the laws, their major provisions, the enforcement process as well as the federal/state interrelationships in this milieu.

SH 630 Product Safety and Liability

An investigation into the legal pitfalls and the human concerns inherent in the marketing and consumption of goods: sellers responsibility, product liability, insurance, labeling requirements. The Consumer Product Safety Act and related acts, the procedures for minimizing legal risk and maximizing human safety and health.

SH 660 Industrial Ventilation

A thorough study of industrial ventilation systems including theory of design, air pollution control, life-cycle costs, automatic controls, instrumentation, relevant codes and standards, and the evaluation of system performance.

SH 661 Microcomputers in Occupational Safety and Health

Introductory course on using microcomputers in occupational safety and health. Instruction in techniques used for data processing, statistical analysis, interfacing with instrumentation and linking with mini- and mainframe computers.

SH 665 Occupational Safety and Health Measurements

Theory and practice of current methods and techniques applicable to occupational safety and health. Experiments in ventilation, nonionizing radiation, measurement of airborne contaminants, noise and heat stress. Instruction on statistical analysis of safety data.

SH 670 Selected Topics

A study of selected issues of particular interest to the students and instructor. May be taken more than once.

SH 690 Research Project I

Prerequisite: permission of the instructor. Independent study under the supervision of an adviser. 1-3 credits.

SH 691 Research Project II

A continuation of Research Project I. 1-3 credits.

SH 693 OSH Internship I

Coordinated with local industry or governmental agencies such as OSHA, NIOSH and EPA. Practical problems in occupational safety or industrial hygiene and approaches to solving these problems under the supervision of a practicing professional. At the end of the project a report will be prepared by the student and will be presented to the OSH faculty for grade evaluation. 1-3 credits.

SH 694 OSH Internship II
A continuation of Internship I. 1-3 credits.

SH 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty. 1-3 credits.

SH 696 Independent Study II
A continuation of Independent Study I. 1-3 credits.

SH 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

SH 699 Thesis II
A continuation of Thesis I.

Sociology

SO 601 Minority Group Relations
An interdisciplinary survey of minority groups in the United States with special reference to ethnic, religious and racial factors that influence interaction.

SO 610 Urban Sociology
Prerequisite: PA 604. The problems of urban growth and development. Residential patterns together with the physical development of cities and their redevelopment. An examination of the people and their relationships to the environment.

SO 620 Sociology of Bureaucracy
A study of some of the classic conceptualizations of bureaucracy and their relevance to the structure and functioning of American economic and governmental institutions. Gives students informational and experiential resources with which they, as planners and managers, can improve their abilities to make effective policy decisions.

SO 641 Death and Suicide
In-depth analysis of suicide. Traditional theories of suicide are analyzed regarding the psychological approach as well as the demographic and group analysis of sociology. The goal of the course is both academic and practical, stressing community application.

SO 649 Seminar in Health and Social Policy
Analysis of the legal, political, social, economic and organizational factors in planning and providing health care services with emphasis on policy formulation and implementation. Current health policy issues.

SO 651 Social Gerontology
Basic introduction to the field of gerontology. Discusses the history and definition of the field, the contributions of academic disciplines to the field, various perception of aging; explores the basic theories, problems and prospects of gerontology.

SO 670 Selected Topics
A study of selected issues of particular interest to the students and instructor. May be taken more than once.

SO 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

SO 696 Independent Study II
A continuation of Independent Study I.

SO 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

SO 699 Thesis II
A continuation of Thesis I.

Tourism & Travel Administration

TT 600 The Tourism Industry
An introductory course designed to acquaint graduate students with the basic principles, practices and philosophies of the tourism industry. Includes: history and organization of tourism, economics of tourism, tourism research and forecasting and planning and development for the travel industry. No credit.

TT 610 Legal Aspects of the Travel Industry
Prerequisite: TT 600 or equivalent. Provides students with knowledge of the legal issues that affect the rights and responsibilities of clients, carriers, suppliers and operators in the travel industry. Includes: travel agency/client relationships and contracts; business practices and liabilities of land, sea and air carriers; legal requirements and personnel issues in the purchase, ownership and sale of travel agencies; and the impact of antitrust laws on the travel agent and the travel industry.

TT 620 Deregulation: A New Era in the Travel Industry
Prerequisite: TT 600 or equivalent. Reviews the events leading to the Airline Deregulation Act of 1978 and subsequent deregulation rulings in the travel industry. The impact of deregulation on the industry will be examined. Includes: travel agency marketing and distribution changes, evolution of regional and trunk carriers, low-cost carriers and their impact on the industry, corporate changes and mergers.

TT 625 Travel Industry Human Resources Development
Prerequisite: TT 600 or equivalent. Personnel functions in the travel industry examined, including recruitment and selection of personnel for positions in a service industry, policies and procedures, compensation, retention and motivation. Study of human resources development including design of employee training programs in sales and communication skills and development of management skills for successful employee relations.

TT 630 International Tourism and Travel
Prerequisite: TT 600 or equivalent. Study of the impact of tourism nationally and internationally, including the political power of tourism, the contributions of tourism to the economy worldwide and the sociocultural aspects of tourism. Examines national and international tourism policies as well as the international organizations that provide assistance to the tourism industry.

TT 635 Corporate Travel
Prerequisite: TT 600 or equivalent. The emergence and impact of the travel management systems handling corporate travel accounts. Knowledge and skills necessary for the development, acquisition, management, service and maintenance of commercial, corporate travel accounts and clients. The consolidation of business travel arrangements and the benefits of travel management corporations and systems.

TT 660 Comparative Tourism
Prerequisite: TT 600 or equivalent. A detailed study of tourism development within mainstream destination countries. An in-depth evaluation of selected foreign countries in relationship to tourism, and their political, geographical, agricultural, religious, climatic and socioeconomic status.

TT 670 Selected Topics
An in-depth examination of topics of particular interest to the students and the instructor. May be taken more than once.

TT 690 Research Project
Prerequisite: 15 graduate hours and permission of the instructor. Independent study under the supervision of an adviser.

TT 695 Independent Study I
A planned program of individual study under the supervision of a member of the faculty.

TT 696 Independent Study II
A continuation of Independent Study I.

TT 698 Thesis I
Prerequisite: 15 graduate hours. Periodic meetings and discussions of the individual student's progress in the preparation of a thesis.

TT 699 Thesis II
A continuation of Thesis I.

Doctoral Program Course Descriptions

EC 703 Forecasting and Econometrics
Prerequisites: MG 701 and MG 702. Contemporary use of advanced forecasting and econometric techniques in modern corporations and in nonprofit/public sector organizations. Computer-aided modeling will be stressed within the framework of corporate planning.

EC 704 Public and Private Policy Interfaces
Descriptions of the varied and complex interfaces and interdependence between public and private organizations. Roles of regulatory agencies and the resultant responses of regulated organizations.

FI 701 Seminar in Financial Policy
Review of contemporary thought relevant to financial policy formulation within organizations. Analysis of capital markets, regulation and resource availability in the context of contributors to overall corporate policy and strategic decision making.

IE 704 Seminar in Management and Control Systems

Topical coverage of contemporary management information systems and their roles in corporate planning and control functions. Resource control systems are reviewed in conjunction with budgeting, cost accounting, organizational communication and managerial decision making.

MG 701 and MG 702 Research Design I and II

Prerequisite: MG 701 for MG 702. These two courses are designed to provide students with basic training in research. Participants will have ample opportunities to examine relationships among ideas, question the basic assumptions, learn methodology and measurements of variables, test hypotheses and interpret the findings. Major focus is also on the application of the advanced statistics topics (including design of experiments, factor analysis and nonparametric analysis) to public and private management problems. Intensive training, guidance and experience in library research, as well as statistical computing by SPSS and other computer statistical package programs, will be provided.

MG 737 Seminar in Management

Review of the state of the art of the management process. Topical coverage of contemporary management theories, trends, developments, successes and failures.

MG 738 Policy and Strategic Decision Making

Intensive review of policy formulation and strategic decision making in large and small organizations, with emphasis on private corporations. Interfaces with government, special interest, labor and foreign organizations are incorporated into the overall policy review process.

MK 701 Seminar in Strategic Marketing

Role of marketing and marketing research in the development of organizational policy and corporate decision making.

P 719 Seminar in Human Resources

Review of contemporary research relevant to the management process in organizations of all types. Topics include specific contributions from behavioral science, organizational development, industrial relations and group dynamics.

MG 801 Dissertation I

Prerequisite: successful completion of the written and oral doctoral comprehensive examinations. Periodic meetings and discussions of the individual student's progress in the preparation of the doctoral dissertation.

MG 802 Dissertation II

Continuation of Dissertation I.

MG 803 Dissertation III

Continuation of Dissertation II.

MG 804 Dissertation IV

Continuation of Dissertation III.

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Veterans' Affairs	**Karen E. Flynn,** B.A., coordinator

FACULTY

Adams, William R., Assistant Professor, Industrial Engineering and Computer Science
B.S.E.E., B.S., M.S., University of New Haven
Aliane, Bouzid, Associate Professor, Electrical Engineering
B.S.E.E., Ecole Polytechnique d'Alger; M.S.E.E., Ph.D., Polytechnic Institute of New York
Allen, Jerry L., Professor, Communication
B.S., Southeast State University; M.S., Ph.D., Southern Illinois University
Baeder, Robert W., Professor, Management and Marketing
B.B.A., Case Western Reserve University; M.B.A., Ph.D., Ohio State University
Barratt, Carl, Associate Professor, Mechanical Engineering
B.Sc., Bristol University; Ph.D., Cambridge University
Bechir, M. Hamdy, Professor, Civil Engineering
B.C.E., Cairo University; M.A.Sc., University of Toronto; Sc.D., Massachusetts Institute of Technology
Bell, Srilekha, Professor, English
B.A., M.A., University of Madras, India; M.A., Ph.D., University of Wisconsin
Bentivegna, Beverly A., Assistant Professor, Dietetics
B.S., M.Ed., Pennsylvania State University
Berman, Peter I., Professor, Finance
A.B., Cornell University; Ph.D., Johns Hopkins University
Boardman, Susan, Assistant Professor, Psychology
B.S., St. Lawrence University; M.A., M.Phil., Ph.D., Columbia University
Bockley, William R., Professor, Management
V.E., Northeastern University; LL.B., LaSalle University; M.B.A., Babson College; Ph.D., Boston College
Boman, Margaret A., Instructor, Mathematics
B.S., Kent State University; M.S., John Carroll University
Broderick, Gregory P., Associate Professor, Civil Engineering
B.S., M.S., Northeastern University; Ph.D., University of Texas at Austin
Brody, Robert P., Associate Professor, Marketing
B.A., Wesleyan University; M.B.A., University of Chicago; D.B.A., Harvard University
Carriuolo, Nancyanne, Professor, English
B.A., M.S., State University of New York College at Brockport; Ph.D., State University of New York at Buffalo
Carriuolo, Ralf E., Professor, Visual and Performing Arts
B.A., Yale University; M.M., Hartt School of Music; Ph.D., Wesleyan University
Carson, George R., Professor, Civil Engineering
B.C.E., City College, New York; M.S.C.E., Columbia University
Celotto, Albert, Instructor of Music, Visual and Performing Arts
B.M., Western Connecticut State University; M.M., Indiana State University

Chandra, Satish, Professor, Law and International Business
B.A., University of Delhi; M.A., Delhi School of Economics; LL.B., Lucknow Law School, India; LL.M., J.S.D., Yale University
Chepaitis, Joseph B., Professor, History
A.B., Loyola College; M.A., Ph.D., Georgetown University
Coleman, Charles N., Assistant Professor, Public Administration
B.A., University of Maryland; M.P.A., West Virginia University
Collura, Michael A., Associate Professor, Chemical Engineering
B.S., Lafayette College; M.S., Ph.D., Lehigh University
Corprew, James C., Associate Professor, Hotel and Restaurant Management
B.S., M.B.A., Old Dominion University; M.S., Georgia State University; Ph.D., Mississippi State University
Davis, Wesley, Lecturer, English
B.S., M.A., Southern Connecticut State University
Desio, Peter J., Professor, Chemistry
B.S., Boston College; Ph.D., University of New Hampshire
Dichele, Ernest M., Professor, Accounting and Tax Law
B.S., University of New Haven; J.D., Boston College Law School; LL.M., Boston University School of Law; C.P.A.
Dinegar, Caroline A., Professor, Political Science
B.A., Cornell University; M.A., Ph.D., Columbia University
Downe, Edward A., Associate Professor, Finance
B.A., Bowling Green State University; M.A., Ph.D., New School for Social Research; A.P.C., New York University
Downey, James, F., Professor, Hotel and Restaurant Management
B.S., Pennsylvania State University; M.S., University of Wisconsin-Stout; Ph.D., Purdue University
Dugan, Robert D., Professor, Psychology
B.A., M.A., University of Kentucky; Ph.D., Ohio State University
Dull, James W., Professor, Political Science
B.A., Wilkes College; M.A., University of Pennsylvania; M.Phil., Ph.D., Columbia University
Eikaas, Faith H., Professor, Sociology
B.A., M.A., Ph.D., Syracuse University
Ellis, Lynn W., Professor, Management
B.S.E.E., Cornell University; M.S., Stevens Institute of Technology; D.P.S., Pace University
Faigel, Oleg, Associate Professor, Mechanical Engineering
Ph.D., Moscow Polytechnical Institute
Faria-Smith, Nancy, Assistant Professor, Accounting
B.B.A., St. Bonaventure University; M.B.A., University of Hartford; C.P.A.
Farrell, Richard J., Lecturer, English
B.A., University of Notre Dame; M.A. University of Virginia; M.Phil., Yale University
Ferringer, Natalie S., Professor, Political Science
B.S., Temple University; M.A., Ph.D., University of Virginia
Fillebrown, Eleanor E., Associate Professor, Accounting
B.S., Simmons College; M.B.A., M.S., Drexel University; C.P.A.
Fischer, Alice, Associate Professor, Industrial Engineering and Computer Science
B.A., University of Michigan; M.A., Ph.D., Harvard University
Fish, Andrew J., Jr., Associate Professor, Electrical Engineering and Computer Science
B.S.E.E., Worcester Polytechnic Institute; M.S., University of Iowa; M.S., St. Mary's University; Ph.D., University of Connecticut

Flaumenhaft, Frank F., Assistant Professor, Management
B.S., University of Pennsylvania; M.B.A., New York University
French, Bruce A., Professor, English
A.B., University of Missouri; M.A., Western Reserve University; M.A., Middlebury College; M.A., Harvard University; Ph.D., New York University
Frey, Roger G., Professor, Industrial Engineering and Computer Science
B.A., Yale College; M.S., Ph.D., Yale University; J.D., Yale Law School
Fridshal, Donald, Professor, Mathematics
B.E.E., M.S., New York University; Ph.D., University of Connecticut
Gaensslen, Robert E., Professor, Forensic Science
B.S., University of Notre Dame; Ph.D., Cornell University
Garber, Brad T., Professor, Occupational Safety and Health Management
B.S., M.S., Drexel University; Ph.D., University of California, Berkeley
George, Edward T., Professor, Industrial Engineering and Computer Science
B.S., M.S., Worcester Polytechnic Institute; D.Engr., Yale University
Gere, William S., Jr., Professor, Industrial Engineering
B.M.E., M.S.I.E., Cornell University; M.S., Ph.D., Carnegie-Mellon University
Glen, Robert A., Professor, History
B.A., University of Washington; M.A., Ph.D., University of California, Berkeley
Golbazi, Ali M., Assistant Professor, Electrical Engineering
B.S., Detroit Institute of Technology; M.S., Ph.D., Wayne State University
Gordon, Judith Bograd, Associate Professor, Sociology
B.A., Brandeis University; M.A., Ph.D., University of Michigan
Gow, Arthur S., III, Assistant Professor, Chemistry and Chemical Engineering
B.A., Muhlenberg College; B.S., B.A., University of Rhode Island; Ph.D., Pennsylvania State University
Greene, Jeffrey, Assistant Professor, English
B.A., Goddard College; M.F.A., University of Iowa; Ph.D., University of Houston
Griscom, Priscilla, Senior Lecturer, Industrial Engineering and Computer Science
B.A., St. John's College; M.A., University of Rhode Island
Harricharan, Wilfred R., Professor, Management
B.S., M.S., Ph.D., Cornell University
Hoffnung, Robert J., Professor, Psychology
A.B., Lafayette College; M.A., University of Iowa; Ph.D., University of Cincinnati
Hosay, Norman, Associate Professor, Industrial Engineering and Computer Science
B.S., Wayne State University; M.S., Ph.D., University of Wisconsin
Hunter, David P., Associate Professor, Professional Studies
B.S., Wagner College; M.P.A., University of New Haven
Hyman, Arnold, Professor, Psychology
B.A., M.A., Brooklyn College; M.S., City College of New York; Ph.D., University of Cincinnati
Jafarian, Ali A., Associate Professor, Mathematics
B.S., Tehran University; M.S., Pahlavi University; Ph.D., University of Toronto
Jayaswal, Shakuntala, Assistant Professor, English
B.A., Ripon College; M.A., Ph.D., University of Wisconsin
Jewell, Walter, Professor, Sociology and Management
A.B., Ph.D., Harvard University
Jones, Richard B., Professor, Mathematics
B.S., M.S., Ph.D., Virginia Polytechnic Institute and State University
Kaloyanides, Michael G., Professor, Visual and Performing Arts
B.A., Ph.D., Wesleyan University

Kaplan, Phillip, Professor, Economics
B.A., University of Massachusetts; M.A., Columbia University; Ph.D., Johns Hopkins University

Karimi, Bijan, Associate Professor, Electrical Engineering
B.S., Aryamehr University of Technology, Iran; M.S., Ph.D., Oklahoma State University

Katsaros, Thomas, Professor, International Business and Economics
B.A., M.A., M.B.A., Ph.D., New York University

Kenig, M. Jerry, Professor, Mechanical Engineering
B.S.M.E., M.S.M.E., Drexel University; M.A., Ph.D., Princeton University

Kirwin, Gerald J., Professor, Electrical Engineering
B.S., Northeastern University; M.S.E.E., Massachusetts Institute of Technology; Ph.D., Syracuse University

Kleinfeld, Ira H., Professor, Industrial Engineering
B.S., M.S., Eng.Sc.D., Columbia University

Kublin, Michael, Associate Professor, Marketing
B.A., Brooklyn College; M.A., Indiana University; M.B.A., Pace University; Ph.D., New York University

Lambrakis, Konstantine C., Professor, Mechanical Engineering
B.S.E.E., M.S.M.E., University of Bridgeport; Ph.D., Rensselaer Polytechnic Institute

Lanius, Ross M., Jr., Professor, Civil Engineering
B.S.C.E., University of Delaware; M.S., University of New Haven; M.S.C.E., University of Connecticut

L'Heureux-Barrett, Tara, Instructor, Psychology
B.A., State University of New York College at Plattsburgh; M.A., University of Connecticut

Maffeo, Edward J., Assistant Professor, Visual and Performing Arts
B.F.A., Rhode Island School of Design; M.A. Columbia University; Ph.D., New York University

Mager, Guillermo E., Assistant Professor, Visual and Performing Arts
B.S., M.A., New York University

Mann, Richard A., Professor, Industrial Engineering and Computer Science
B.S.M.E., University of Wisconsin; M.S.M.E., Northwestern University; Ph.D., University of Wisconsin

Marks, Joel, Associate Professor, Philosophy
B.A., Cornell University; M.A., Ph.D., University of Connecticut

Marx, Paul, Professor, English
B.A., University of Michigan; M.F.A., University of Iowa; Ph.D., New York University

Maxwell, David A., Professor, Law and Criminal Justice
B.B.A., University of Miami; M.A., John Jay College; J.D., University of Miami

McDonald, Robert G., Associate Professor, Accounting
B.S., City College, New York; M.B.A., New York University; C.M.A., C.I.A., C.F.A., C.P.A.

McLaughlin, Marilou, Professor, Communication
B.A., M.A., Villanova University; Ph.D., University of Wisconsin

McNeill, Gilbert, Associate Professor, Economics
B.A., M.A., Ph.D., University of Geneva

Mensz, Pawel, Associate Professor, Quantitative Analysis
M.S., Warsaw Politechnic; Ph.D., Systems Research Institute of the Polish Academy of Sciences

Mentzer, Thomas L., Professor, Psychology
B.S., Pennsylvania State University; M.S., Ph.D., Brown University

Mercilliott, Frederick, Professor, Professional Studies
B.S., M.P.A., John Jay College; M.S., University of New Haven; M.Ph., Ph.D., City University of New York; D.A., Western Colorado University

Moffitt, Elizabeth J., Professor, Visual and Performing Arts
B.F.A., Yale University; M.A. Hunter College
Montazer, M. Ali, Associate Professor, Industrial Engineering and Computer Science
B.S., M.S., Ph.D., State University of New York at Buffalo
Moon, Paul R., Associate Professor, Electrical Engineering
B.S., Clarkson University; M.Sc., Ph.D., University of Manitoba
Morris, David J., Jr., Associate Professor, Marketing
B.S., M.S., Ph.D., Syracuse University
Morris, Michael A., Professor, Psychology
B.S., M.A., Ph.D., Boston College
Morrison, Richard C., Professor, Physics
A.B., Princeton University; M.S., Ph.D., Yale University
Mottola, Louis, Associate Professor, Management
B.A., Clarkson College of Technology; M.S., George Washington University; Ph.D., University of Northern Colorado
Nadim, Abbas, Associate Professor, Management
B.A., Abadan Institute of Technology, Iran; M.B.A., University of California, Berkeley; Ph.D., University of Pennsylvania
Neal, Judith A., Associate Professor, Management
B.S., Quinnipiac College; M.A., M. Phil., Ph.D., Yale University
Norton, William M., Associate Professor, Criminal Justice
B.S., Louisiana State University; M.S., Ph.D., Florida State University; J.D., University of Connecticut Law School
O'Keefe, Daniel C., Professor, Electrical Engineering
B.E.E., City University of New York; M.S.E.E., Carnegie-Mellon University; Ph.D., Worcester Polytechnic Institute
Okrent, Howard, Associate Professor, Industrial Engineering and Computer Science
B.Sc., University of California, Los Angeles; S.M., Ph.D., Massachusetts Institute of Technology
Orabi, Ismail, Associate Professor, Mechanical Engineering
B.S., Helwan University, Egypt; M.S., State University of New York at Buffalo; Ph.D., Clarkson University
Pan, William, Professor, Quantitative Analysis
B.S., National Cheng Kung University, Taiwan; M.B.A., Auburn University; Ph.D., Columbia University
Parker, Joseph A., Professor, Economics
B.A., Lehigh University; M.A., Ph.D., University of Oklahoma
Parker, L. Craig, Jr., Professor, Criminal Justice
A.B., Bates College; M.Ed., Springfield College; Ph.D., State University of New York at Buffalo
Parthasarathi, M. N., Director, Materials Technology; Senior Lecturer, Mechanical Engineering
B.S., Banares Hindu University, India; M.S., Ph.D., University of Illinois
Penn, Richard L., Jr., Assistant Professor, Professional Studies
B.S., United States Air Force Academy; B.A., University of Maryland; M.A., Central Michigan University
Porter, Oliver, Assistant Professor, Shipbuilding and Marine Technology
B.S., Central Michigan University; M.A., University of Northern Colorado; M.S., Massachusetts Institute of Technology
Rainish, Robert, Professor, Finance
B.S., City College, New York; M.B.A., Ph.D., City University of New York
Raucher, Steven A., Professor, Communication
B.A., Queens College; M.S., Brooklyn College; Ph.D., Wayne State University

Robin, Gerald D., Professor, Criminal Justice
B.A., Temple University; M.A., Ph.D., University of Pennsylvania
Rolleri, Michael, Assistant Professor, Accounting
B.S., University of Bridgeport; M.B.A., University of Connecticut; C.P.A.
Rosenthal, Erik, Professor, Mathematics
B.A., Queens College, City University of New York; M.A., Ph.D., University of California, Berkeley; M.S., State University of New York at Albany
Ross, Stephen M., Professor, Mechanical Engineering
B.E., New York University; Ph.D., Johns Hopkins University
Sachdeva, Baldev K., Professor, Mathematics
B.S., M.A., Delhi University; Ph.D., Pennsylvania State University
Sack, Allen L., Professor, Sociology
B.A., University of Notre Dame; M.A., Ph.D., Pennsylvania State University
Saleeby, B. Badri, Professor, Mechanical Engineering
B.S.M.E., Cooper Union; M.S.M.E., Ph.D., Northwestern University
Saliby, Michael, Associate Professor, Chemistry
B.S., Union College; Ph.D., State University of New York at Binghamton
Sanders, Matthew S., Assistant Professor, Industrial Engineering and Computer Science
B.S., M.S., Indiana State University; Ph.D., Texas Tech University
Sandman, Joshua, Professor, Political Science
B.A., M.A., Ph.D., New York University
Sarris, John, Professor, Mechanical Engineering
B.A., Hamilton College; M.S., Ph.D., Tufts University
Shapiro, Steven J., Assistant Professor, Economics
B.A., University of Virginia; M.A., Ph.D., Georgetown University
Sharma, Ramesh, Assistant Professor, Mathematics
B.S., M.S., Ph.D., Banaras Hindu University, India; Ph.D., University of Windsor
Sherwood, Franklin B., Professor, Economics
B.A., M.A., University of Connecticut; Ph.D., University of Illinois
Simerson, Gordon R., Associate Professor, Psychology
B.A., University of Delaware; M.A., Ph.D., Wayne State University
Sloane, David E. E., Professor, English
B.A., Wesleyan University; M.A., Ph.D., Duke University
Smith, Donald C., Associate Professor, Communication
B.A., Southern Connecticut State University; M.A., Emerson College; Ph.D., University of Massachusetts at Amherst
Smith, Donald M., Associate Professor, English
A.B., Guilford College; A.M., Columbia University; Ph.D., New York University
Smith, Warren J., Professor, Management
B.S., University of Connecticut; M.B.A., Northeastern University
Sommers, Alexis N., Professor, Industrial Engineering
B.M.E., Cornell University; M.S., Rutgers University; Ph.D., Purdue University
Stanley, Richard M., Professor, Mechanical Engineering
B.E.S., Johns Hopkins University; M.S., M.Phil., Ph.D., Yale University
Staugaard, Burton C., Professor, Biology and Environmental Science
A.B., Brown University; M.S., University of Rhode Island; Ph.D., University of Connecticut
Surti, Kantilal K., Professor, Electrical Engineering
B.E., University of Gujarat, India; M.E.E., University of Delaware; Ph.D., University of Connecticut
Suster, Zeljan, Assistant Professor, Economics
B.A., M.A., Ph.D., University of Belgrade, Yugoslavia

Tedefalk, Edyth, Associate Professor, Management
B.S., University of Minnesota; M.S., Ph.D., University of North Dakota
Tedefalk, Rolf K., Professor, Finance
B.S.B., Ph.D., University of Minnesota; C.F.P., C.F.A.
Teluk, John J., Professor, Economics
B.A., Graduate School of Economics, Munich, Germany; B.A., University of New Haven; M.A., Free University, Munich, Germany
Theilman, Ward, Associate Professor, Economics
B.A., Ph.D., University of Illinois
Todd, Edmund N., Associate Professor, History
B.A., M.A., University of Florida; M.A., Ph.D., University of Pennsylvania
Tokuz, R. Yucel, Associate Professor, Civil and Environmental Engineering
B.S., M.S., Middle East Technical University, Ankara, Turkey; Ph.D., Vanderbilt University
Torello, Robert J., Assistant Professor, Management and Quantitative Analysis
B.A., University of Connecticut; M.S., Southern Connecticut State University; M.B.A., University of New Haven
Tyndall, Bruce, Professor, Mathematics
B.A., M.S., University of Iowa
Uebelacker, James W., Professor, Mathematics
B.A., LeMoyne College; M.A., Ph.D., Syracuse University
van Dyke, Elisabeth, Associate Professor, Tourism and Travel Administration
B.A., University of California, Los Angeles; M.A., Ph.D., Columbia University
Vieira, Frank, Professor, Professional Studies
B.S., Quinnipiac College; M.S., Southern Connecticut State College
Vigue, Charles L., Professor, Biology and Environmental Science
B.A., M.S., University of Maine; Ph.D., North Carolina State University
Vitalo, Paul E., Assistant Professor, Mathematics
B.S., St. Francis College, New York; M.S., Ph.D., Stevens Institute of Technology
Voegeli, Henry E., Professor, Biology and Environmental Science
B.A., University of Connecticut; Ph.D., University of Rhode Island
Wakin, Shirley, Professor, Mathematics
B.A., University of Bridgeport; M.A., Ph.D., University of Massachusetts
Wall, David J., Professor, Civil Engineering
B.S.C.E., M.S.C.E., University of Connecticut; Ph.D., University of Pittsburgh
Walters, Gary, Instructor, Industrial Engineering and Computer Science
B.A., Eastern Connecticut State University; B.A., University of Connecticut; M.S., University of New Haven
Warner, Mark M., Assistant Professor, Hotel and Restaurant Management
B.A., Monmouth College, Illinois; B.S., Cornell University; M.A., State University of New York College at Plattsburgh
Washington, Dany J., Associate Professor, Professional Studies
B.S., Bethune-Cookman College; M.A., Columbia University; Ph.D., Southeastern University
Wentworth, Ronald N., Professor, Industrial Engineering
B.S.M.E., Northeastern University; M.S.I.E., University of Massachusetts; Ph.D., Purdue University
Werblow, Jack, Professor, Public Administration
B.A., Cornell University; M.B.A., University of Pennsylvania; Ph.D., University of Cincinnati
Wheeler, George L., Professor, Chemistry
B.A., Catholic University of America; Ph.D., University of Maryland

Whitley, W. Thurmon, Professor, Mathematics
B.S., Stetson University; M.A., University of North Carolina at Chapel Hill; Ph.D., Virginia Polytechnic Institute and State University

Williams, Brenda R., Associate Professor, English
B.A, Howard University; M.A.Ed., Ph.D., Washington University

Wnek, Robert E., Associate Professor, Tax Law, Accounting and Business Law
B.S.A., Villanova University; LL.M., Boston University School of Law; J.D., Delaware Law School of Widener College; C.P.A.

Woodruff, Martha, Assistant Professor, Economics
B.S., M.A., Murray State University; M.S., University of New Haven

York, Michael W., Professor, Psychology
B.A., M.A., Southern Methodist University; Ph.D., University of Maryland

Zajac, Roman N., Assistant Professor, Biology and Environmental Science
B.S., Tufts University; M.S., Ph.D., University of Connecticut

Zinser, Jerry T., Assistant Professor, Visual and Performing Arts
B.F.A., Hartford Art School; M.F.A., Rutgers University

Faculty Professional Licensure and Accreditation

Bechir, M. Hamdy, Professional Engineer, Connecticut, Florida, Massachusetts, New Hampshire, Rhode Island, Vermont, Oklahoma
Bentivegna, Beverly A., Registered Dietician, American Dietetic Association
Bockley, William R., Certified Purchasing Manager
Broderick, Gregory P., EIT, Massachusetts
Carson, George R., Professional Engineer, Connecticut, Massachusetts, New York, New Jersey; Landscape Architect, Connecticut; Land Surveyor, Connecticut, Massachusetts; Professional Planner, New Jersey
Collura, Michael, Professional Engineer, Pennsylvania
Dichele, Ernest M., Certified Public Accountant, Connecticut, Massachusetts; Attorney at Law, Connecticut, Massachusetts
Dugan, Robert D., Psychologist, Connecticut; Diplomate in Industrial Psychology of the American Board of Professional Psychology
Faigal, Oleg, Professional Engineer, Connecticut
Faria-Smith, Nancy, Certified Public Accountant, Connecticut
Fillebrown, Eleanor, Certified Public Accountant, New Jersey
Garber, Brad T., Certified in General Toxicology, Certified in the Comprehensive Practice of Industrial Hygiene, Certified Safety Professional
Hoffnung, Robert J., Clinical Psychologist, Connecticut
Hunter, David P., Airline Transportation Rated Pilot, Certified Flight Instructor, Certified Ground Instructor
Hyman, Arnold, Consulting Psychologist, Connecticut
Kenig, M. Jerry, Professional Engineer, Pennsylvania, Michigan
Kirwin, Gerald J., Professional Engineer, Connecticut, Massachusetts
Lanius, Ross M., Jr., Professional Engineer, Connecticut, New Jersey
Mann, Richard A., Professional Engineer, Wisconsin
Maxwell, David A., Certified Protection Professional
McDonald, Robert G., Certified Public Accountant, New York; C.M.A.; C.I.A.; C.F.A.
Mercilliott, Frederick, Certified Protection Professional; Private Investigator, Connecticut
Norton, William M., Attorney at Law, Connecticut; American Bar Association, Connecticut Bar Association
Parker, Joseph A., Accredited Personnel Specialist
Parker, L. Craig, Jr., Consulting Psychologist, Wisconsin; Certified Psychologist, Province of Alberta, Canada
Penn, Richard L., Jr., Commercial Pilot, Instrument Rating
Rolleri, Michael, Certified Public Accountant, Connecticut
Surti, Kantilal K., Chartered Engineer, United Kingdom
Tedefalk, Rolf K., Chartered Financial Analyst, Certified Financial Planner
Tokuz, R. Yucel, Professional Engineer, Ohio
van Dyke, Elisabeth, Certified Travel Counselor
Wall, David J., Professional Engineer, Connecticut, Pennsylvania
Wnek, Robert E., Certified Public Accountant, Connecticut; Member of Bar, Connecticut, Pennsylvania
York, Michael W., Clinical Psychologist, Connecticut

Practitioners-in-Residence

Balba, Hamdy, Chemistry and Fire Science
Ph.D., University of California, Berkeley

Coviello, Salvatore, Accounting and Taxation
B.S., University of Bridgeport; M.S., University of Hartford; C.P.A.
Associate Chief, Appeals, I.R.S. Regional Counsel

Culhane, Michael C., Economics
B.A., Loyola College of the University of Montreal; M.A., Fairfield University; LL.B., University of Bridgeport School of Law

Goodrow, Lloyd S., Criminal Justice
B.S., St. Michael's College; M.A., State University of New York at Albany; J.D., University of Connecticut; Attorney at Law, Connecticut

Hu, Hui, Industrial Engineering and Computer Science
B.S., Beijing Teachers College; M.S., Ph.D., Stanford University

Johnson, William, Fire Science
M.A., Southern Connecticut State University

Krause, Leonard A., Occupational Safety and Health
Sc.D., University of Cincinnati; Certified in the Comprehensive Practice of Industrial Hygiene, Certified Safety Professional; Director, Environmental Hygiene and Toxicology, Olin Corp.

Lee, Henry C., Forensic Science
Ph.D., New York University; Director, Forensic Science Laboratory, State of Connecticut

Sandel, Susan L., Public Management
B.A., Barnard College, Columbia University; M.A.; Goddard College; Ph.D., Union Graduate School; Certified Fellow, American College of Health Care Administrators; Licensed Long-Term Health Care Administrator

Schwartz, Pauline M., Chemistry and Chemical Engineering
Ph.D., University of Michigan; Pharmacologist, Veterans Administration Medical Center; Associate Research Scientist, Department of Dermatology, Yale University School of Medicine

Smotas, Paul F., Management and Quantitative Analysis
M.S., Central Connecticut State College

Tapley, Edward L., Occupational Safety and Health
B.S., M.S., University of New Haven; Certified in the Comprehensive Practice of Industrial Hygiene, Certified Safety Professional

Turcotte, Margaret M., Management
B.S., M.B.A., University of New Haven

Wasielewski, Timothy, Biology and Environmental Science
B.A., University of Massachusetts; M.S., University of New Haven

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University of New Haven

Please print or type.
Complete both sides.

Graduate School application for admission

University of New Haven, 300 Orange Avenue, West Haven, CT 06516

Instructions for applicants:

This application must be filled out and returned to the Graduate School, University of New Haven, 300 Orange Avenue, West Haven, CT 06516, along with:

1. A $50 non-refundable application fee. This application cannot be processed unless accompanied by the fee.
2. Official transcripts forwarded by all colleges previously attended.
3. Two letters of recommendation.

Today's Date _____

Legal Name ☐ Mr. ☐ Ms. _____
Family name (surname) First Middle

Names different from above that may appear on academic records _____

Current Mailing Address _____ Telephone No. ( ) _____
Street Apt. # Area Code

_____
City or Post Office State Zip Code

Permanent Address (if different from above) _____
Street Apt. # City or Post Office State Zip Code

Birth Date _____ Social Security No. _____

Program for which you are applying: _____

Concentration choice within that program, if any: _____

Do you plan to study ☐ part time or ☐ full time?

Indicate the trimester you intend to start graduate study:

☐ September, 19____ ☐ January, 19____ ☐ April, 19____ ☐ Summer, 19____

Will you be applying for financial aid (domestic students only)? ☐ Yes ☐ No

How did you learn about UNH Graduate School? ☐ Admission Representative ☐ Alumni Recruiter ☐ College Fair
☐ Direct Mail ☐ Faculty Referral ☐ Friend ☐ Print Media Ad ☐ Area Resident ☐ Radio/TV
☐ Corporate Referral ☐ Readmission ☐ Grad School Guide ☐ Student ☐ Other _____

For U.S. citizens only (optional):

In order to meet federal and state reporting requirements, the university needs to obtain the information requested below. UNH is committed to equal access to educational and employment opportunities regardless of race, creed, color, religion, age, sex, national origin or disability. The information you provide will have no effect on your application. (Please ✓ all items that apply.)

White (non-Hispanic)	☐	Asian or Pacific Islander	☐	Male	☐
Black (non-Hispanic)	☐	American Indian or Alaskan Native	☐	Female	☐
Hispanic	☐	Other _____	☐	Disabled	☐

please turn over

Scholastic Record (list in chronological order all colleges and universities attended)

Name of School	Location	Attendance From – To	Date of Graduation	Degree	Major Program

Employment Record (from present position to include the past five years)

Position Held	Date	Name of Employer	Location	Telephone No.

Citizenship: Are you a citizen of the U.S.? YES ☐ NO ☐

NON-U.S. CITIZENS MUST COMPLETE THE FOLLOWING QUESTIONS:

1. **Resident Status**
   Are you a permanent resident of the U.S.? YES ☐ NO ☐
   If answer is YES: List your alien registration number A _ _ _ _ _ _ _ _ _ and complete questions 2 and 3 below.
   If answer is NO: Complete all questions below. Do not leave any blank spaces.
   Write in NA (not applicable) if a question does not apply to you.

2. **Personal Information:** Male _____ Female _____
   Place of Birth _____ Country of Citizenship _____

3. **Language Information:**
   A. I shall take, or have taken the TOEFL (Test of English as a Foreign Language) examination on: Date: _____
      Place: _____ Score: _____
   B. First language of use: _____
      Number of years of formal instruction in English: _____ Where _____

4. **Immigration Information:**
   A. What is your current visa status? (if none go to section B) Circle one:

      B-1 B-2 F-1 F-2 H H-1 J-1 J-2 L M Other _____

      School or organization issuing document used to obtain entry into the U.S.: _____
      Date of initial entry into the U.S.: _____ Admission number: _____
      (The admission number is located on the top portion of Form I-20 I.D.).
   B. What type visa will you be applying for: _____

Certificate To Be Signed By All Applicants

The information supplied on this application is complete and true to the best of my knowledge. All materials and supporting records submitted by me or on my behalf in connection with this application or my attendance will not be released to anyone other than authorized university personnel without my consent.

It is understood that incorrect or falsified information will be grounds for disapproval of this application or dismissal from the university. The undersigned agree(s) to pay all financial obligations if admitted to and attending the university, including obligations incurred if financial aid is terminated, reduced or postponed for any reason.

The undersigned also authorize(s) the Office of Public Relations of the university to publish the applicant's picture, address, major, honors, sports or other activities for public relations purposes should the applicant decide to attend the university in any capacity. This publicity authorization may be rescinded by notifying the Office of Public Relations in writing within 30 calendar days of admission to the university.

Applicant's Signature _____ Date _____

The University of New Haven does not discriminate in admission or employment on the basis of sex, race, religion, age, national origin or disability. The University of New Haven is an equal opportunity/affirmative action institution.

University of New Haven

Please Print or Type.
Complete both sides.

Please Expedite

RECOMMENDATION FORM

To be completed and returned directly to:
UNIVERSITY OF NEW HAVEN GRADUATE ADMISSIONS
300 ORANGE AVENUE
WEST HAVEN, CONNECTICUT 06516

Name of applicant _____ Undergraduate college _____

Program to which applicant is applying _____

TO THE RESPONDENT: The above-named person has applied for admission to the Graduate School of the University of New Haven. Please provide us with your estimate of the qualifications of this candidate and of the reasonableness of his or her academic goals. It will help us if you indicate how long and in what capacity you have been acquainted with the candidate. If possible, compare his or her competence, motivation and intellectual ability with others you have known with similar goals. A candid, thoughtful statement, free of exaggeration will be most useful to us. Please use reverse side of this sheet when necessary.

In conformity with the Family Educational Rights and Privacy Act of 1974 we cannot regard letters of recommendation as confidential unless students waive their right to inspect such letters. If you wish the school to keep this information confidential, please have the applicant sign the waiver on the back of this page.

please turn over

Recommendation, cont'd.

I: ☐ recommend strongly ☐ recommend ☐ recommend with reservation

☐ do not recommend this candidate for graduate study at the University of New Haven.

Name _____

Position _____

Address _____

Date _____

Signature _____

Since the applicant expects your response to be considered as part of his/her application, we plan to defer action on the application until hearing from you.

Thank you for your assistance.

WAIVER

I hereby waive my right to inspect any letters of recommendation written to the University of New Haven Graduate School on my behalf by _____

(Applicant's Signature) _____

University of New Haven

Please Print or Type.
Complete both sides.

Please Expedite

RECOMMENDATION FORM

To be completed and returned directly to:
UNIVERSITY OF NEW HAVEN GRADUATE ADMISSIONS
300 ORANGE AVENUE
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please turn over

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☐ do not recommend this candidate for graduate study at the University of New Haven.

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Position _____

Address _____

Date _____

Signature _____

Since the applicant expects your response to be considered as part of his/her application, we plan to defer action on the application until hearing from you.

Thank you for your assistance.

WAIVER

I hereby waive my right to inspect any letters of recommendation written to the University of New Haven Graduate School on my behalf by _____.

(Applicant's Signature) _____

Transcript Request Sheet. To be filled out and mailed directly to the school or schools from which transcripts are requested. This form may be photocopied as necessary. Most schools charge from two to five dollars for this service. Again, under the Family Rights and Privacy Act, this form must be signed before it is sent.

Request for college transcript.

I approve the release of an official copy of my transcript to the University of New Haven.

____
Signature — Date

TO: Registrar

____
name of college or university

____
address

____

Please send an official transcript of my work to:

Dean of the Graduate School
University of New Haven
300 Orange Avenue
West Haven, CT 06516

Name ____________________

Date of Birth ____________________

Date of Graduation ____________________

Years attended ____________________

Current address ____________________

____

- -

Transcript Request Sheet. To be filled out and mailed directly to the school or schools from which transcripts are requested. This form may be photocopied as necessary. Most schools charge from two to five dollars for this service. Again, under the Family Rights and Privacy Act, this form must be signed before it is sent.

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____
Signature — Date

TO: Registrar

____
name of college or university

____
address

____

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University of New Haven
300 Orange Avenue
West Haven, CT 06516

Name ____________________

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Date of Graduation ____________________

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Current address ____________________

____

- -

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Signature — Date

TO: Registrar

____
name of college or university

____
address

____

Please send an official transcript of my work to:

Dean of the Graduate School
University of New Haven
300 Orange Avenue
West Haven, CT 06516

Name ____________________

Date of Birth ____________________

Date of Graduation ____________________

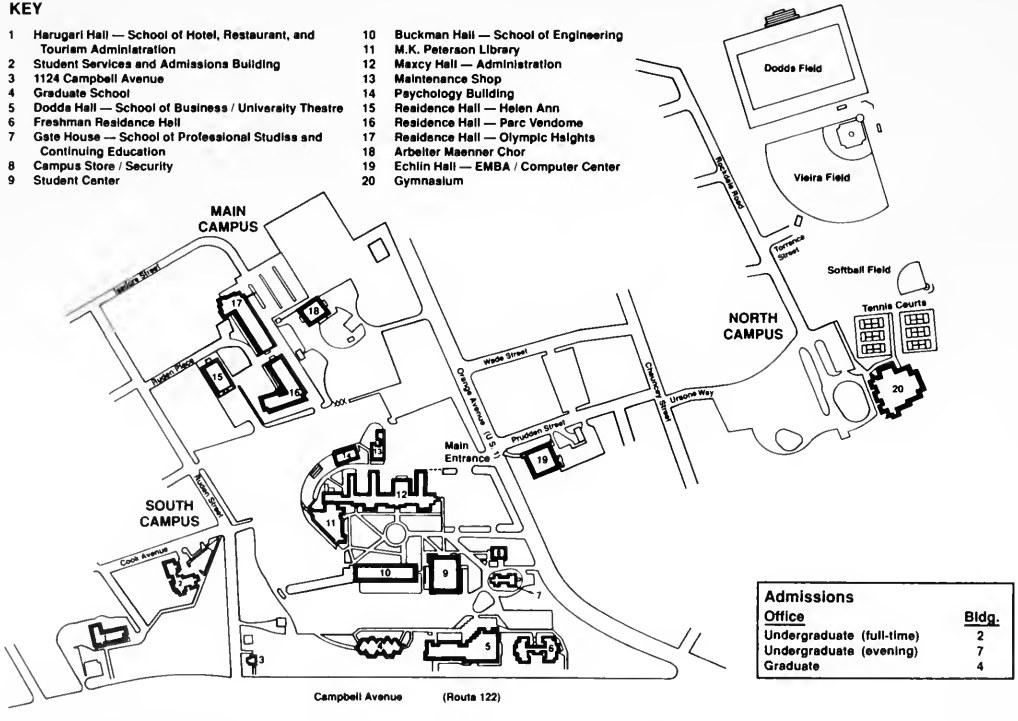
Years attended ____________________

Current address ____________________

____

KEY

1 Harugari Hall — School of Hotel, Restaurant, and Tourism Administration
2 Student Services and Admissions Building
3 1124 Campbell Avenue
4 Graduate School
5 Dodds Hall — School of Business / University Theatre
6 Freshman Residence Hall
7 Gate House — School of Professional Studies and Continuing Education
8 Campus Store / Security
9 Student Center
10 Buckman Hall — School of Engineering
11 M.K. Peterson Library
12 Maxcy Hall — Administration
13 Maintenance Shop
14 Psychology Building
15 Residence Hall — Helen Ann
16 Residence Hall — Parc Vendome
17 Residence Hall — Olympic Heights
18 Arbeiter Maenner Chor
19 Echlin Hall — EMBA / Computer Center
20 Gymnasium



Admissions

Office	Bldg.
Undergraduate (full-time)	2
Undergraduate (evening)	7
Graduate	4

University of New Haven
Graduate School
300 Orange Avenue
West Haven, CT 06516

SECOND CLASS
POSTAGE PAID
NEW HAVEN, CT